GAS JOURNAL

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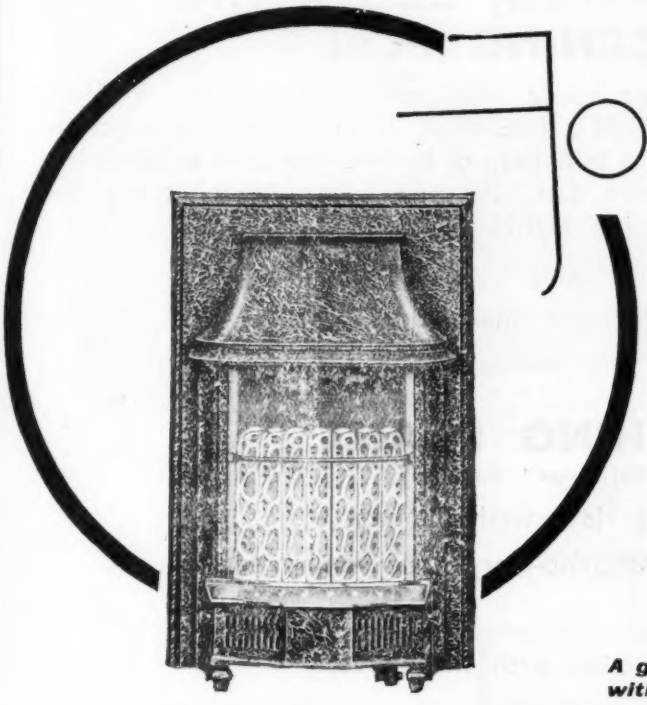
[Founded in 1849 as the "Journal of Gas Lighting."]

Vol. 203. 85th Year. LONDON, JULY 19, 1933. No. 3661. Price 1s.



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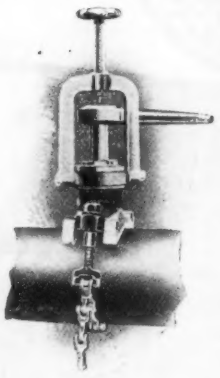

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Fig. 1096.

Drayton Retort House Governor, the Dial-Set Low Pressure Regulator. Control within $\frac{1}{50}$" w.c.; geared, calibrated, setting device, unvarying sensitivity. List No. 163.

The DRAYTON REGULATOR and INSTRUMENT Co, Ltd.,
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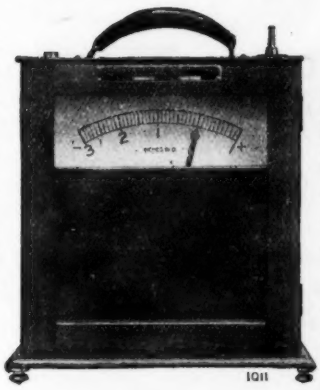


Fig. 1011.

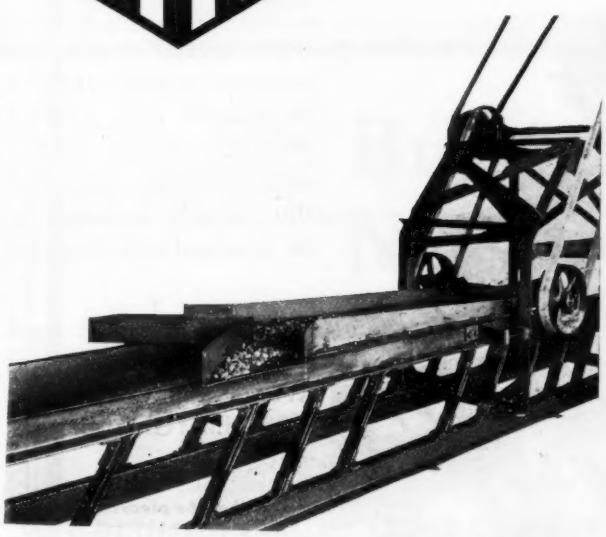
Drayton Portable Pressure / Vacuum Indicator. Also supplied for differential pressure or with recorder. Available in wall or panel mounting case. List No. 107c.

Fig. 1081.

Drayton V.T. Temperature Regulator for the automatic control of Purifiers Ensures uniformity of gas and minimum water consumption. List No. 102c.

253

COKE SCREENS.



"H.H." Coke Screen at Wolverhampton Gas Works.

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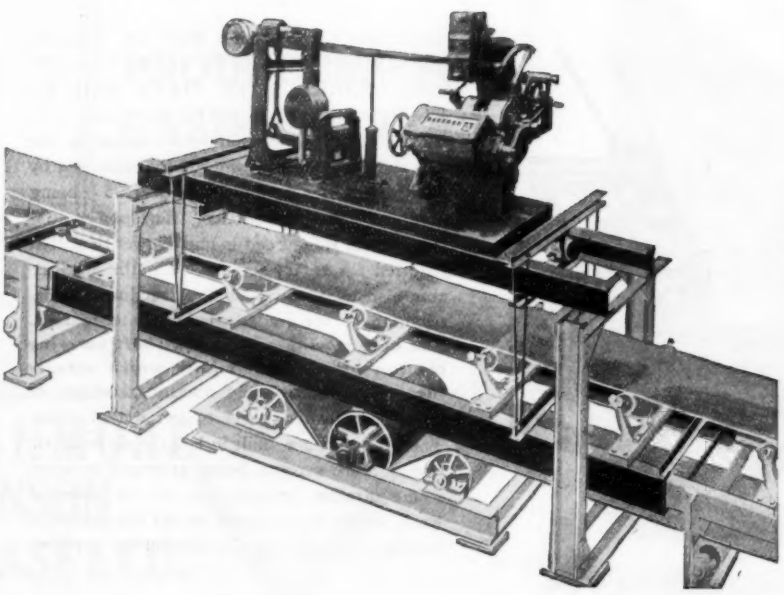

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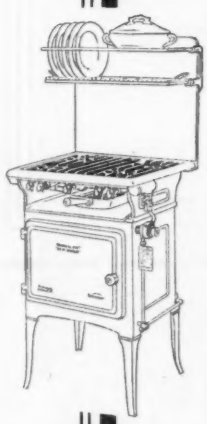

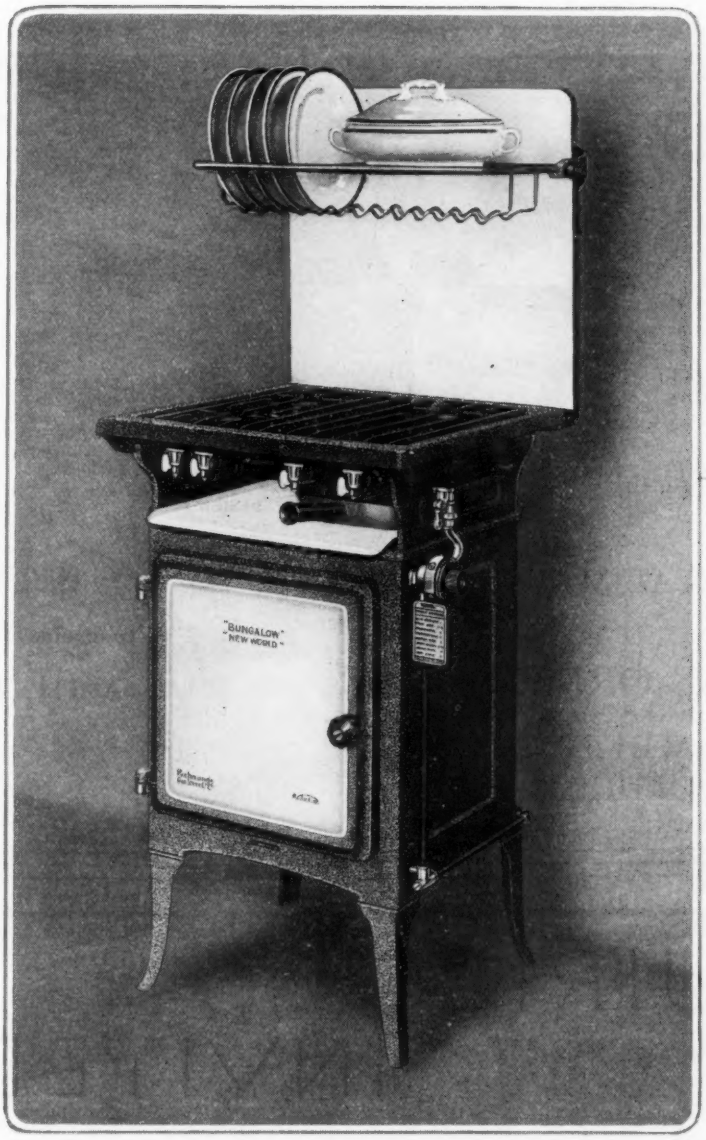

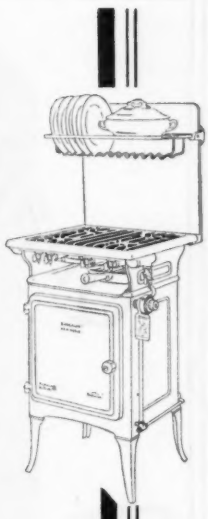

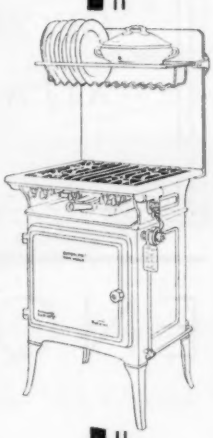

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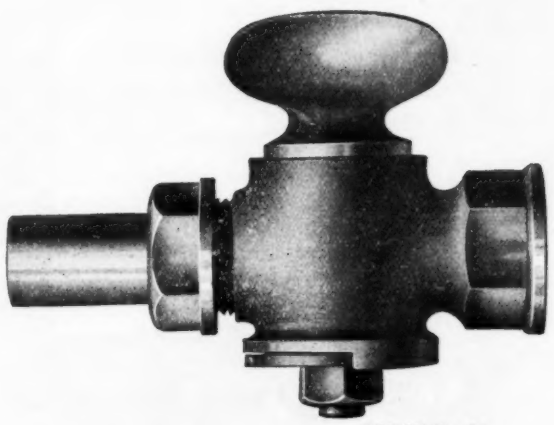

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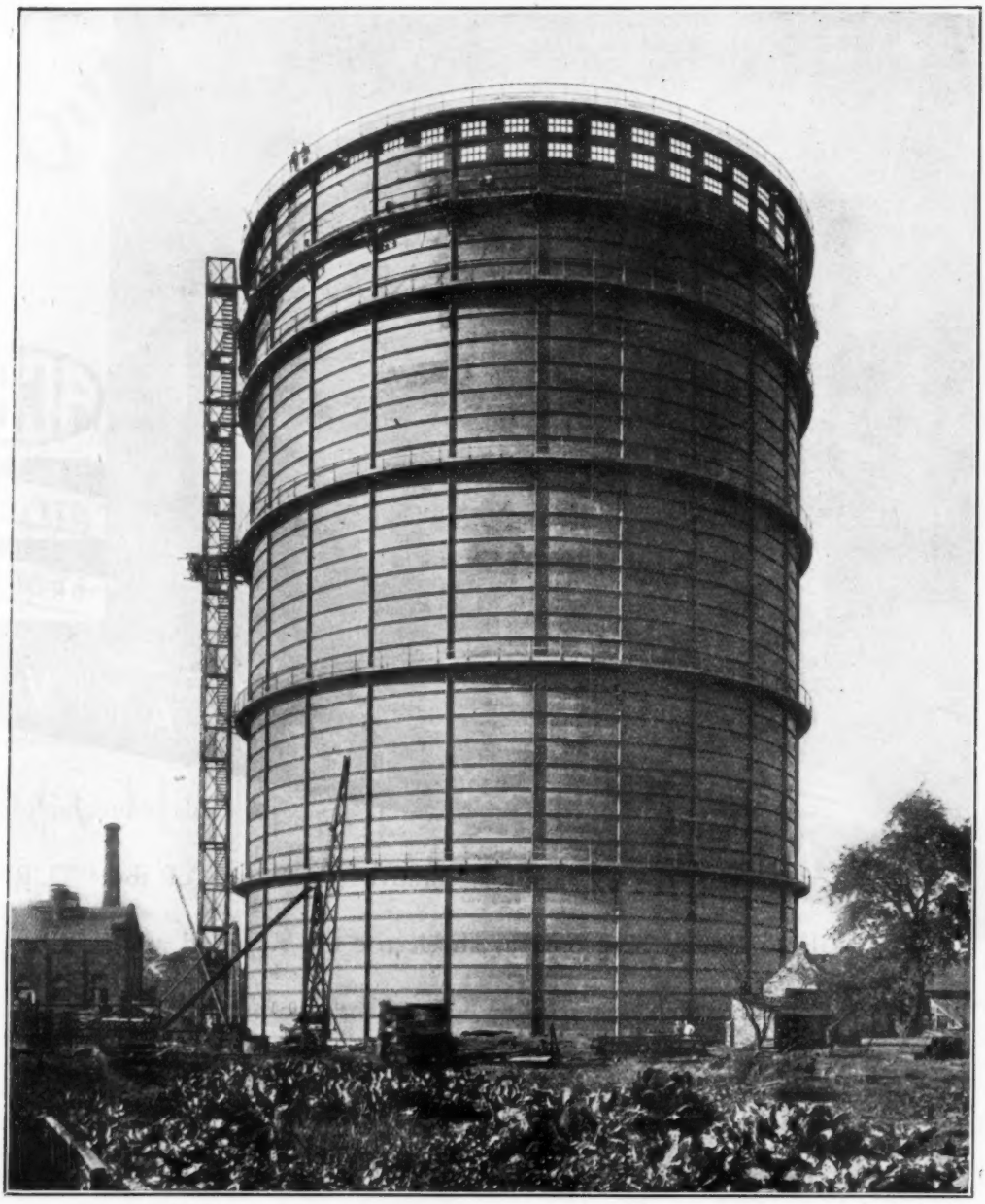

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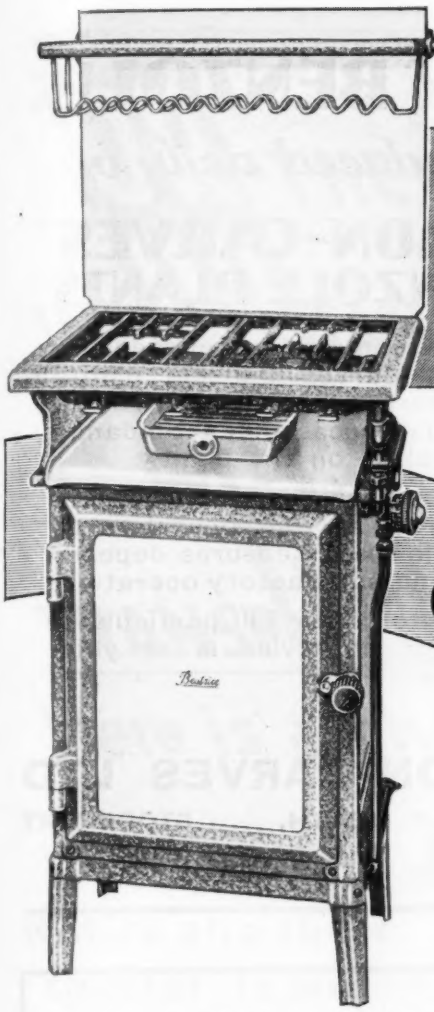

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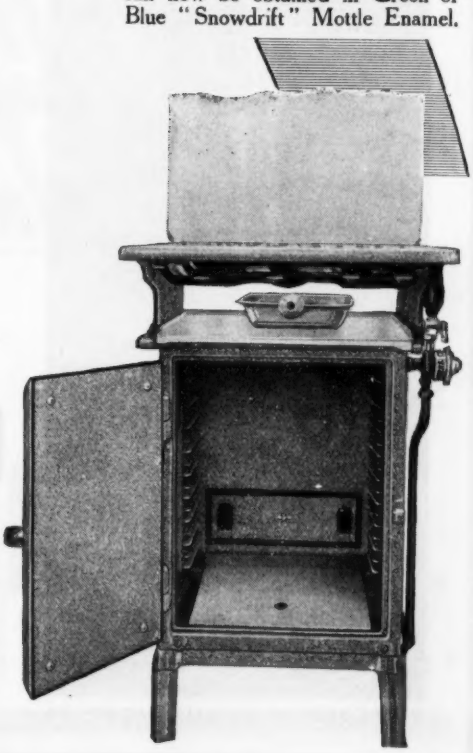

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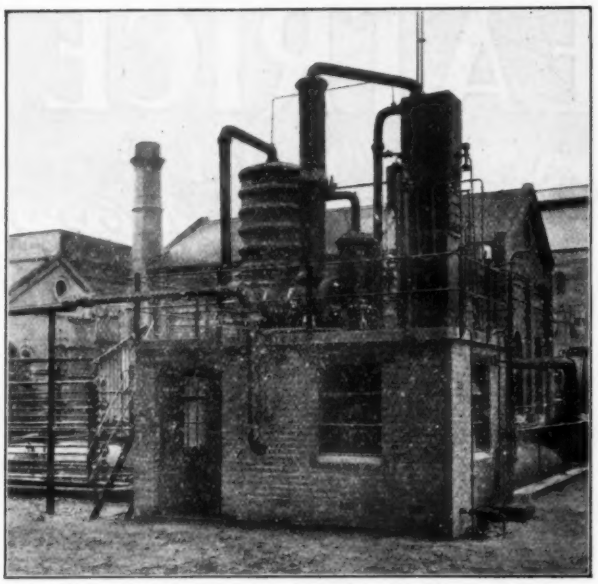

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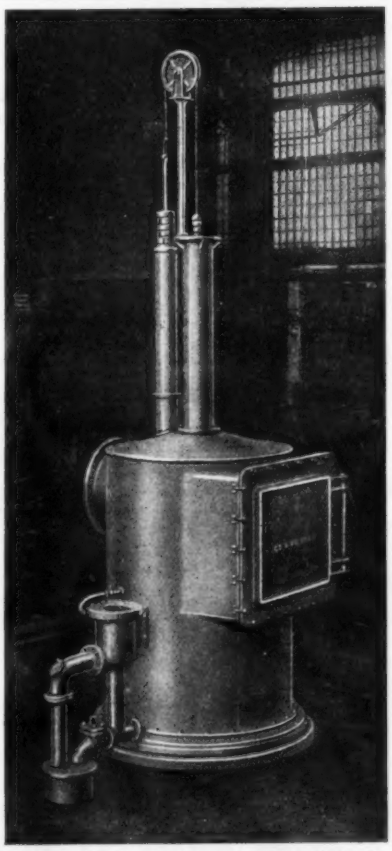

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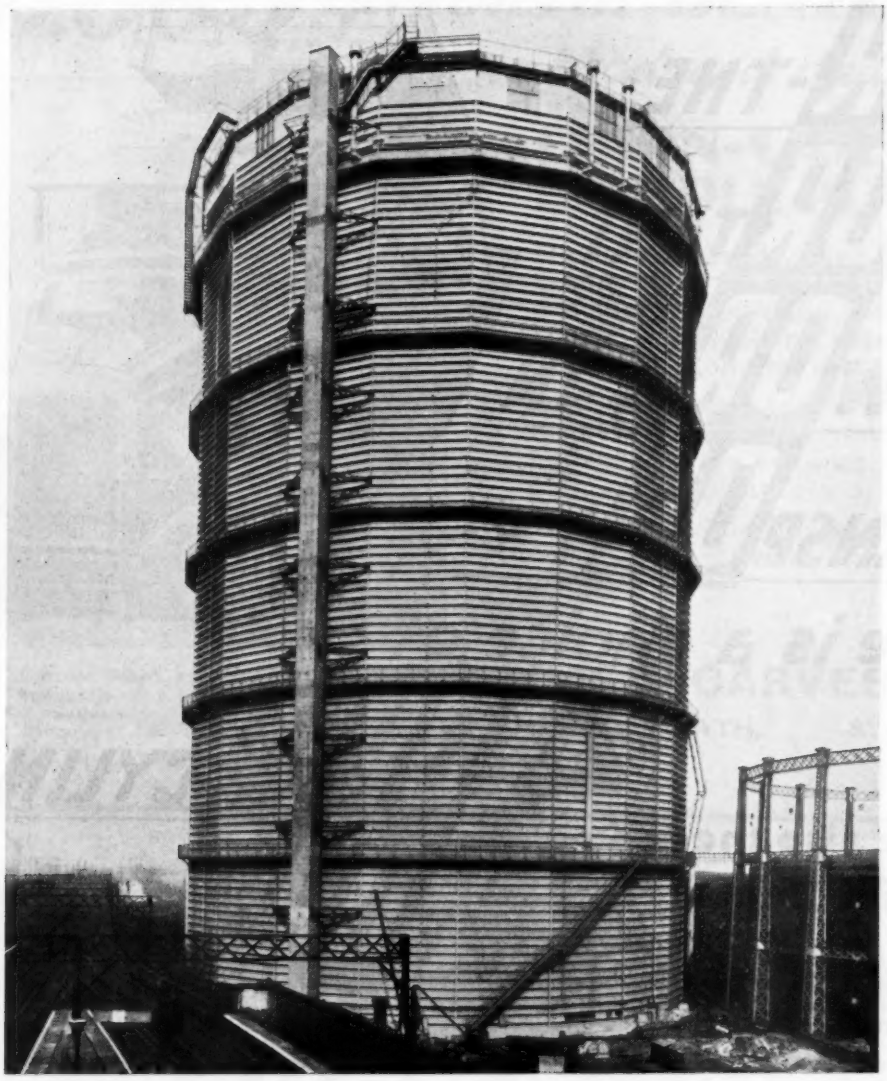

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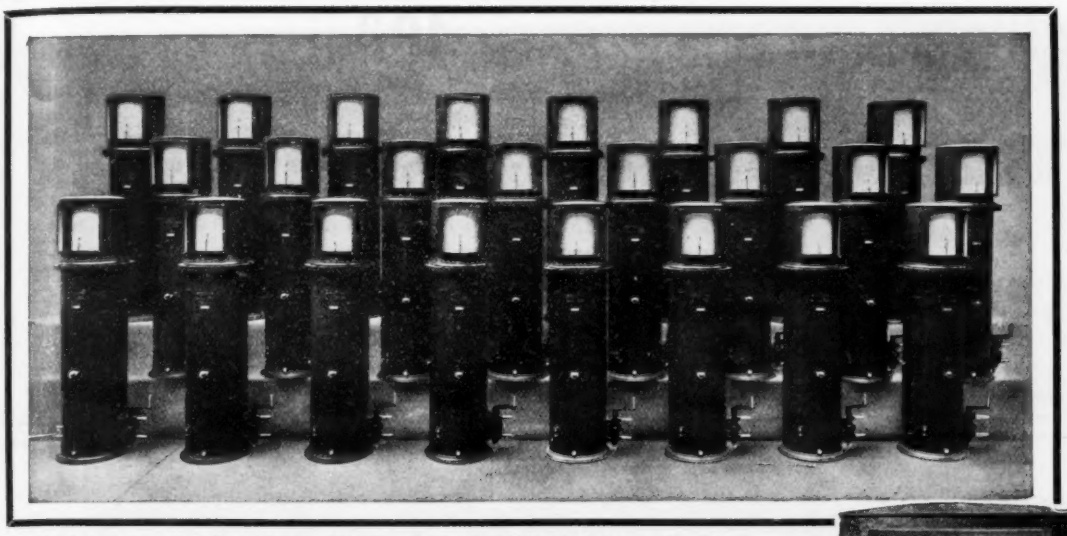
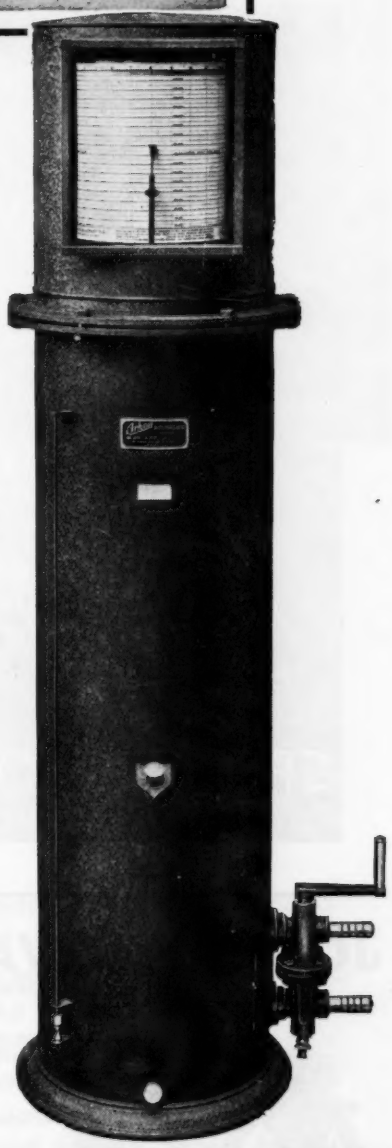


24 Arkon Gas Flow Recorders supplied to the Broken Hill Proprietary Co., Ltd., N S.W., for measuring coke oven gas. Repeat orders have since been received.

ARKON GAS FLOW RECORDERS



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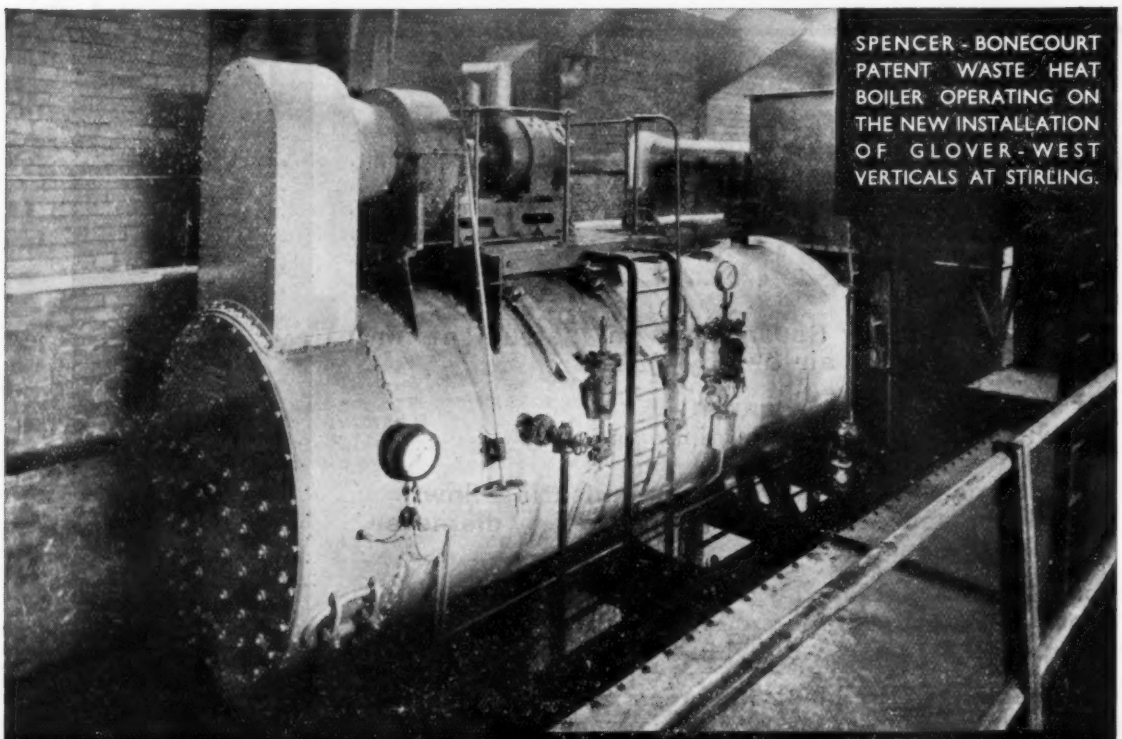

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TRADE MARK.

Fig. 705 "SINGLE RAM" STEAM-PUMP.

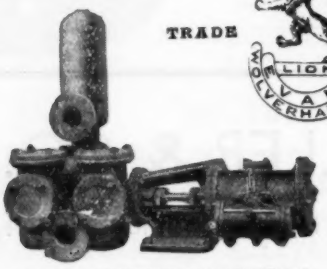


Fig. 598. "CORNISH" STEAM-PUMP FOR BOILER FEEDING, &c.

Fig. 685. "RELIABLE" STEAM PUMP FOR TAR AND THICK FLUIDS.

Fig. 712. "DOUBLE-RAM STEAM-PUMP.

"and again, we thank you . . ."

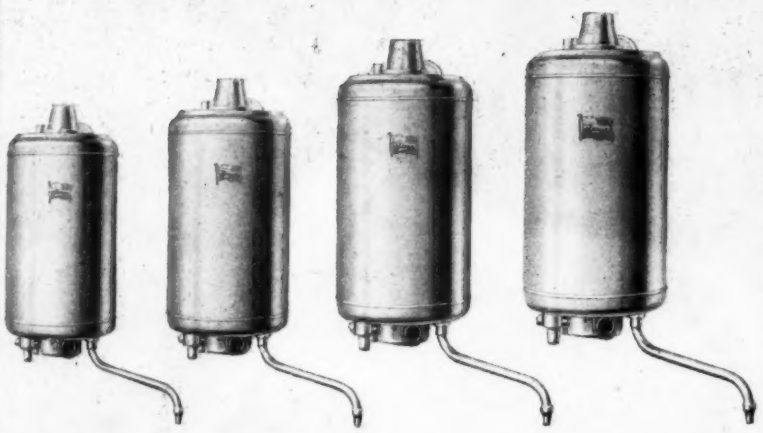
The close of another financial year gives us further cause for satisfaction. Our works have been enlarged—we are giving employment to a greater number of people—and our turnover has increased by eleven per cent.

The success of our business depends upon the goodwill of those gas authorities we are privileged to serve. That we serve them well is evinced by their continued support, but before embarking upon another trading year, we would like to mark our appreciation of their kindness to us in the past, and to say again in all sincerity—"Gentlemen, we thank you."

GEORGE WILSON GAS METERS, LIMITED,

COVENTRY, LONDON AND MANCHESTER

THE "ENSIGN" WATER HEATER



A NEW RANGE of

Storage Water Heaters

(Wall-mounting type)

Modern in design and pleasing in appearance

TYPE	E.3.	E.5.	E.8.	E.10.
Capacity ..	2½ gall.	5 gall.	8 g ll.	10 gall.
Gas Rate, B.TH.U/HRS.	5,000	10,000	20,000	30,000
Overall Size	9" x 18"	11½" x 20"	13" x 22"	14" x 24"

Circulation control thereby producing perfect stratification, and enabling **really hot** water to be drawn a few minutes after lighting. This circulation control is visible, and, if necessary, can be cleaned without dismantling the heater. All models are finished in a good quality cream cellulose, with chromium plated fittings; they can, however, be obtained in a complete chromium plated finish if desired.

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Reliable thermostat control. All sizes are fitted with the well-known "Hurro-stat." Send at once for full details.

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(Robins System)

COAL & COKE HANDLING & SCREENING PLANT FOR OLDHAM CORPORATION

The complete coal and coke handling and screening equipment has been designed, manufactured and erected by Fraser and Chalmers Engineering Works. The entire output of coke is screened and graded by F. & C.-Robins Gyrex and Vibrex Screens and Rotary Grizzlies.

Manufacturers—

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(Proprietors: The General Electric Co., Ltd.)

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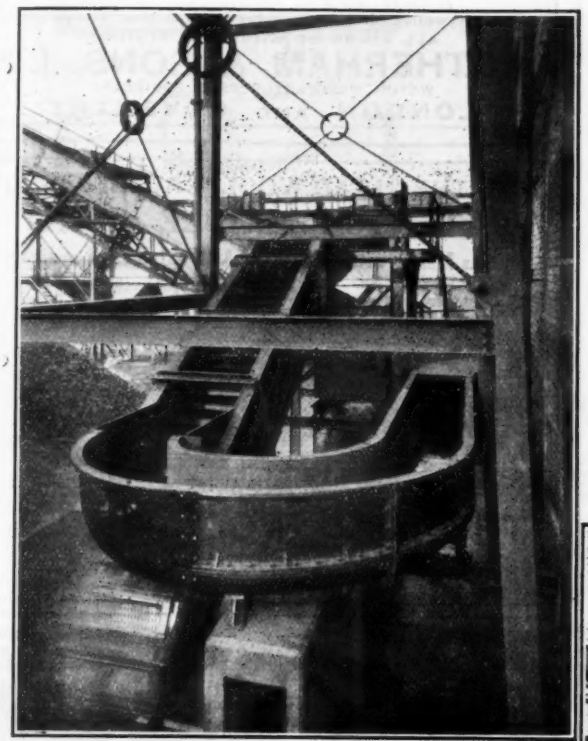
Associated with Robins Conveying Belt Co., of U.S.A.

Gasworks Plant by GIBBONS = = =



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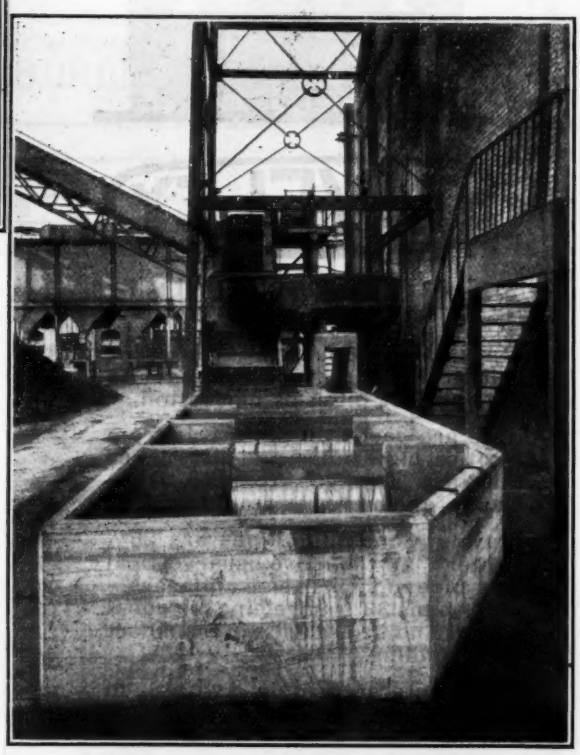

Le Fleurve Coke Conveyor, Installed at the Rochester Works of the Rochester, Chatham, & Gillingham Gas Co.

"GIBBONS-KOGAG" COKE OVEN PLANT

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DUDLEY, WORCS.

AND AT LONDON, BRISTOL, AND DARLINGTON.

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SAND SPUN

Staveley Sand Spun Pipes represent British Foundry technique at its very highest pitch of perfection.

Here are cast iron pipes free from cavities, blow-holes, and dirt—pipes that are stronger, tougher, more elastic, and more resistant to shock.

Staveley Sand Spun Pipes are 25% lighter than the more usual vertical cast pipe of similar size and class—this means 33% more pipe for equal weight and thus saving in transport and handling.

Less joints are required with Sand Spun Pipes owing to their 16′ 0″ length.

Staveley Sand Spun Pipes are ideal for application as water and gas mains.

Staveley Sand Spun Pipes are supplied in 16-ft. lengths, and all diameters 4″ to 15″, with or without beads on spigots.

Larger Sizes
Sizes up to 18″ will be available within 2 months and up to 24″ by the end of this year.

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PRESSURE GAUGE MOVEMENTS
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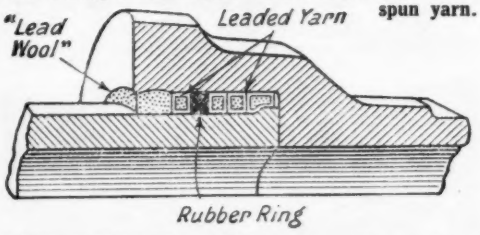
PATENT FLEXIBLE JOINT
for Gas Mains, with LEADED YARN in place of ordinary spun yarn.



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SNODLAND, KENT
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Kleenoff
REGISTERED
cleans cookers
WITHOUT RUBBING OR SCRUBBING

It's so easy with "Kleenoff" to remove even the hardest baked-on grease.

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PER TIN.

Consistently and extensively advertised.

Supplied in ½-cwt. Drums & 14 lb. Tins. Extra strong for stove shops.

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Proprietors: Bale & Church Ltd.

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for High or Low Pressures

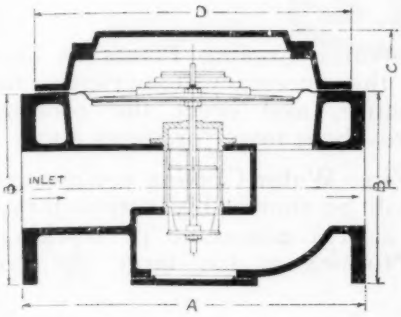

Fig. 106

Peebles & Company's Underground District Governors for high or low pressures are obtainable in all standard sizes. These may be placed above or below ground, controlled by hand loading weights, or air pressure from a distance, or by simple clock-work mechanism. Governors have been supplied to deal with 10 lbs. inlet pressure, delivering at inches water gauge.

Write for our Governor catalogue.

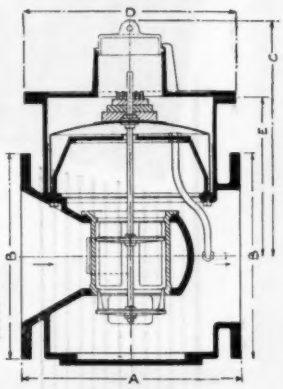

Fig. 42

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Tay Works
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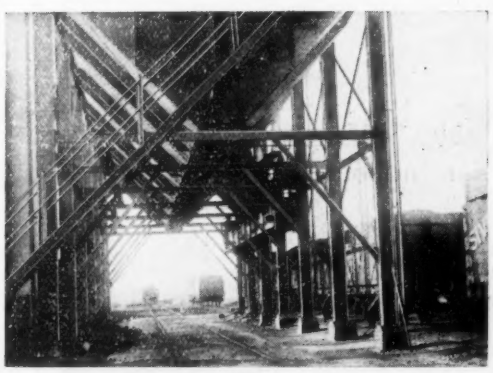
MODERN COKE SCREENING AND GRADING PLANTS



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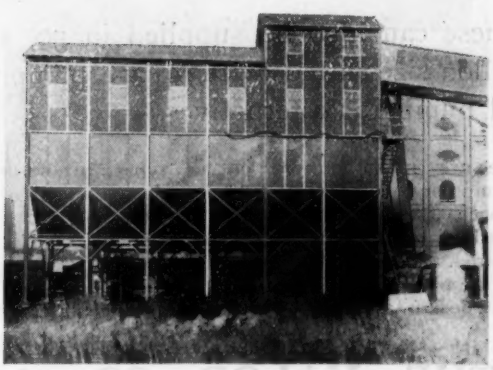

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Your enquiries are invited.

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Water Cooling at its best

With scores of Water Cooling Plants to our credit we have the necessary experience to design, manufacture, and erect the cooling plant you require—be it tower or spray pond.

By specifying Visco Water Cooling you ensure a plant that will be thoroughly satisfactory, and we give a firm guarantee of working efficiency. Nothing is too large or too small for us.

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VALOR
Storage Equipment *for* Lubricating Oils

THREE 150-gallon tanks fitted with adjustable self-measuring pumps, barrel cradle and dash for indoor storage.

These can also be supplied in 50, 100, 200, 250 and 300 gallon sizes fitted with quart pumps, semi-rotary or gear oil pumps as alternatives.

We are manufacturers of all types of outdoor Storage Equipment, comprising a Sliding-door Cabinet of 55 gallons capacity, barrel covers, drum shelters, portable outfits, etc., fitted with pumps as above or customers' own pumps where desired. We are in a position to give prompt delivery of standard models and are prepared to quote customers' own design and finish where desired.

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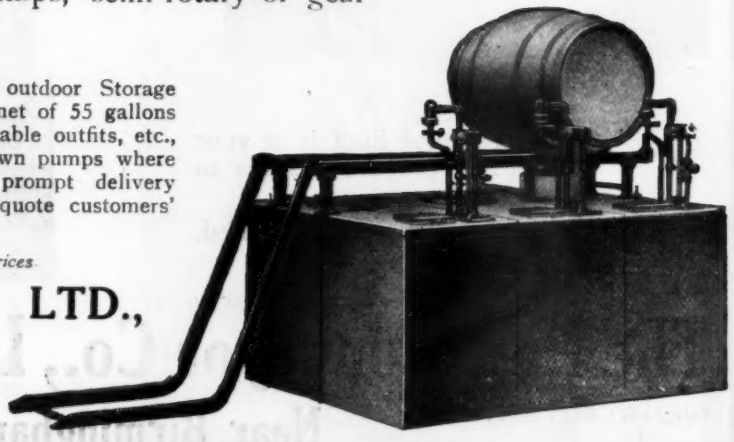

THE VALOR CO., LTD.,
VALOR WORKS, BROMFORD, ERDINGTON, BIRMINGHAM.
LONDON: 120, Victoria Street, S.W.1.

L.I.

PREPARED STAVELEY OXIDE

For many years past, discerning Gas Managers up and down the country have found that Staveley Prepared Oxide of Iron gives unusually good results in their Purifier Plants.

This is due to the fact that this well-tried Staveley product is a *VIRGIN** material, specially and solely prepared for Gas Works use.

It is delivered ready for use and, whilst by no means expensive, it gives consistently good results.

Full particulars and sample loads will gladly be sent upon request.

* Whilst there is no question of reconditioned burnt spent oxide being used in the product advertised — the Staveley Company, however, are regular and large buyers of spent oxides for use in other branches of their Chemical manufacturing business. This may be worthy of your notice.

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NEAR CHESTERFIELD

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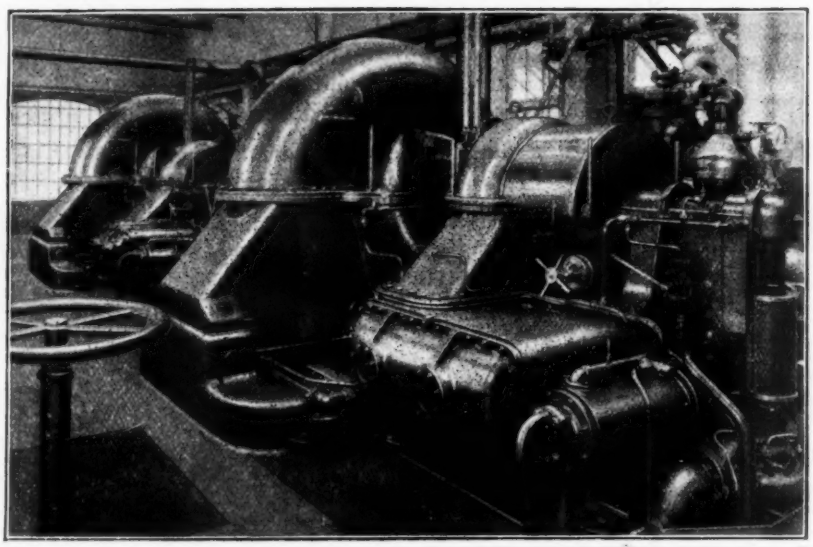
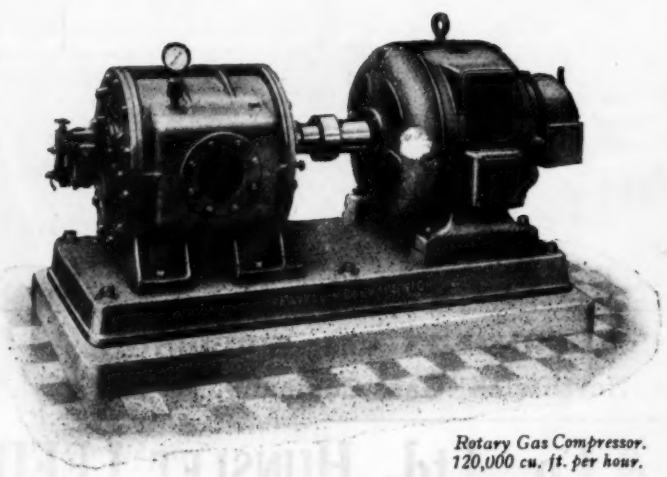


Illustrated above are two Turbo Boosters with capacities of 2,000,000 cubic feet of gas per hour each. They are direct-coupled to Steam Turbines.

We have supplied numbers of Steam Turbine and Motor Driven Exhausters for Coke Oven Plants; Steam Turbine, Motor and Gas Engine Driven Gas Boosters and Rotary Compressors for Transmission and Distribution Purposes; Portable Compressor Units for Breaking up Roadways with Pneumatic Picks for Laying Gas Mains, and for Caulking and Testing Pipe Lines; and Turbo Blowers for Water Gas Plants. If you send us particulars of your requirements we will quote you for suitable plant.



Rotary Gas Compressor. 120,000 cu. ft. per hour.

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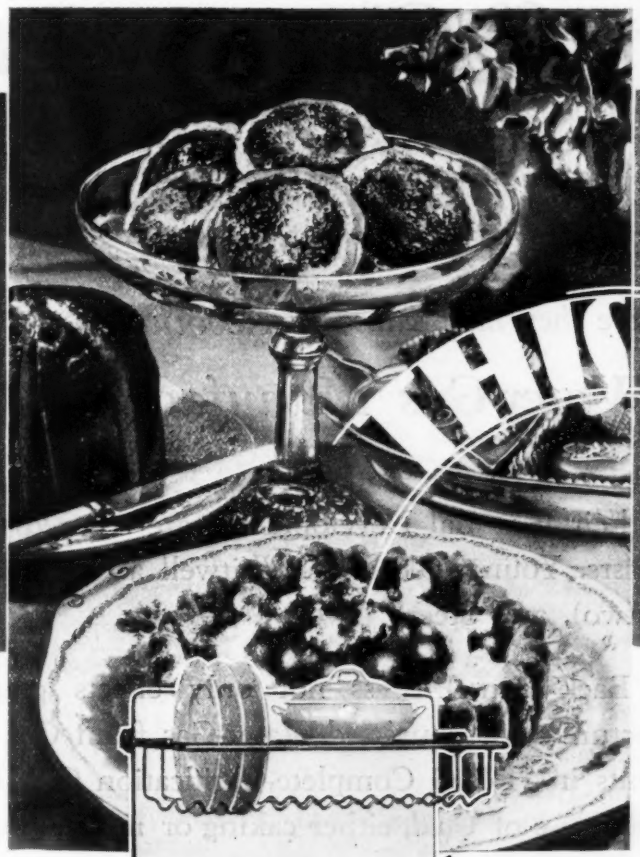

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'KINGSWAY'

"NEW WORLD"

SERIES TWO NO. 125

IF Fletcher's have little to say to you about this new series of "Kingsway" "New World" Cookers, it is because they have never before offered a cooker that so emphatically proclaims its own virtues!

Design and proportion are happy; the oven has ample working room—and the construction and finish are Fletcher's best yet. Note the floor clearance given by the well-raised stand—a good point for the busy housewife here! What a real argument does this new series give the Industry, to point the moral and adorn the tale of gas cooking progress

Send for Price Lists.

FLETCHER RUSSELL

WARRINGTON AND LONDON
(Radiation, Ltd., Proprietors.)
& CO. LTD.

Humphreys & Glasgow Ltd.

own

The Back-Run Processes

outside of America where they have caused a **Revolution** *in*

Carburetted-Water-Gas Manufacture

These Processes and their Essential Developments are secured to H & G by Patents of Messrs. Young, Glasgow, Whitwell and Steere, Stelfox (two), Chrisman (two), and Steere (two).

The 3-Phase Cycle Back-Run Process not only effects great economies in the manufacture of Carburetted-Water-Gas from Coke, but its recent Developments in H & G Complete-Gasification C-W-G Plant effect the most efficient use of *Coal*, either caking or non-caking.

Among other H & G Revolutionary Productions with which these Back-Run Processes have been incorporated are:—

Self-Steaming Generators;
Safety Self-Operating Plant;
Self-Charging Generators;
Self-Clinkering Generators;
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And Now—

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Fortieth Anniversary Standards

129 Patents Current or Applied for in the United Kingdom alone.

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A UNIQUE & AMAZING METHOD OF OVEN CONSTRUCTION WHICH NO OTHER COOKER POSSESSES !

THE GOVERNOR-GENERAL GAS COOKER is the most striking advance in the development of the SINGLE BURNER OVEN.

THE PATENT BOTTOM FLUE by its ingenious method of construction compels the heat to circulate throughout the entire oven, giving a BETTER Heat Distribution before it leaves at the Bottom by means of the PATENTED DOOR FLUE. The Heat then takes its natural course up the flue in the door, along the passage over the dome of the cooker, and finally passing out of the flue outlet in the CORRECT POSITION at the top of the oven.

THE AUTOMATIC OVEN CONTROL ASSURES ECONOMICAL AND EFFICIENT COOKING SERVICE

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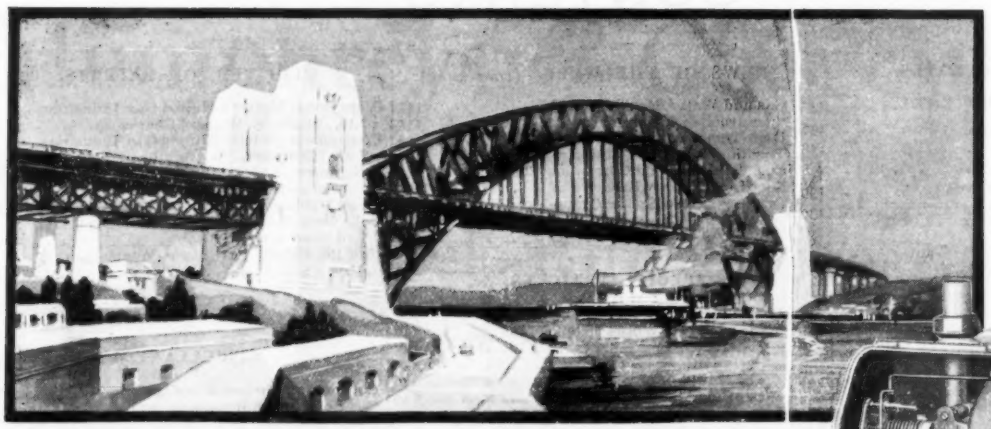
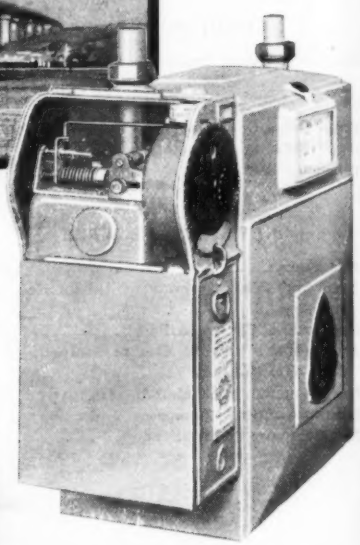


The Mark of Fine Craftsmanship.



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Three Sterling Qualities embodied in the building of THOMAS GLOVER METERS

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ORIGINAL DRY GAS METER MAKERS ESTABLISHED 1844

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Raphael St., Cromac St., BELFAST

THE GAS JOURNAL

JULY 19, 1933

Vol. 203. 85th Year No. 3661

A Glance at the Contents—

New Radiation Research Kitchen.

Sir David Milne-Watson opened on July 13 a new research kitchen for Radiation Ltd., which represents in all respects the most modern ideas of construction and fitting. [p. 153.]

Croydon Company Inaugurate Holder.

A new 1½ million spirally-guided holder was officially inaugurated for the Croydon Gas Company at Carshalton on July 10 by the Chairman of the local Urban District Council. [p. 151.]

National Gas Council.

A meeting of the Central Executive Board of the National Gas Council was held on July 11, when Sir David Milne-Watson was unanimously re-elected Chairman for the ensuing year. [p. 152.]

New Plant Inaugurated at Weymouth.

On Wednesday of last week, Sir Francis Goodenough, C.B.E., inaugurated new gas-works plant for the Weymouth Consumers' Gas Company, erected on land which has been reclaimed from mudflats. [p. 145.]

A Hundred Years of Gas at Morpeth.

The Morpeth Gas Light Company celebrated its hundredth anniversary in April last, and in commemoration of this event a Centenary Brochure has been published—edited and compiled by Major Ralph Crawford, Director of the Company since 1899 and Chairman since 1901. [p. 141.]

The Gum Problem in the Distribution System.

In a paper presented before the Tenth Annual Distribution Conference, Pittsburgh, Mr. J. A. Perry, of the United Gas Improvement Company, dealt with the important subject of the gum problem in the distribution system. [p. 157.]

Sampling and Analysis of Coke.

The British Standards Institution have just issued a British Standard Specification for the Sampling and Analysis of Coke. The minimum weights of gross samples specified have been determined after extensive trials on both oven and gas coke. [p. 144.]

Society of Chemical Industry.

Tribute was paid at the Annual Meeting of the Society of Chemical Industry, held in Newcastle, to Prof. W. A. Bone, on the occasion of the presentation to him of the Society's Medal. Prof. Bone subsequently delivered a lecture entitled "Forty Years of Combustion Research." [p. 155.]

East Hull Gas Bill.

The Board of Trade has lost no time in putting into effect the proposals of the Gas Legislation Committee with regard to the calculation of profits for the purpose of dividend payment under the basic price. Clauses to give effect to this are included in the East Hull Gas Bill which was before the Unopposed Committee of the House of Commons on July 11. [p. 161.]

Forthcoming Engagements

July 20.—S.B.G.I.—Council Meeting at 2.30 p.m.

July 21.—MANCHESTER DISTRICT ASSOCIATION.—Visit to the Higginshaw Gas-Works, Oldham. Paper by Mr. Norman Hudson, Mirfield—"Observations on the Differential Charges of Gas for Distribution Purposes."

July 24.—I.G.E.—Meeting of Liquor Effluents and Ammonia Sub-Committee.

July 25.—I.G.E.—Meetings of Joint Research Committee, 10.30 a.m.; General Research Committee, 2.30 p.m.

Aug. 15.—IRISH ASSOCIATION.—Annual Meeting at Waterford.

Sept. 4-7.—ASSOCIATION OF PUBLIC LIGHTING ENGINEERS.—Tenth Annual Meeting and Conference at Margate.

Sept. 7.—NORTH BRITISH ASSOCIATION.—Annual Meeting in Paisley.

Sept. 21.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Meeting at Porthcawl.

Nov. 7-8.—I.G.E.—Autumn Research Meeting.

1933 "JOURNAL" Directory.

Page 68. TIPTON. W. Williams appointed Engineer and Manager vice G. R. Macfarlane.

Page 74. WIGAN. F. Betley, Engineer and Manager, retired.

EDITORIAL NOTES

Oil from Coal

IT would be difficult to exaggerate the importance of the results it is hoped may accrue from a statement made by the Prime Minister in the House of Commons last Monday, which we reproduce to-day, on the subject of the steps that the Government intend immediately to take to encourage the production of oil from coal in this country. The figures involved are such as to capture the imagination, holding out, as they do, promise of what, in certain circumstances and in certain directions, might amount almost to an industrial revolution. The possibilities held out, in the first instance, to the coal industry will be welcomed by all, as will also the suggestion of the ultimate independence of this country in the matter of petrol, contained in the Government proposals that light hydrocarbon oils manufactured in this country from indigenous coal, shale, or peat, or from products derived from those substances, shall, over a term of years, enjoy a preference over foreign oils, which is guaranteed not to fall below 4d. a gallon.

The Parliamentary Correspondent of *The Times* explains that a figure of 3s. has been taken as the total amount of the preference during the next ten years, so that if the duty continues at its present figure of 8d. a gallon there will be a preference of 8d. a gallon for 4½ years from April 1, 1935. If, on the other hand, the duty should be reduced to 4d. a gallon, and should remain at that figure, then the home-produced oil will enjoy a preference of 4d. a gallon for nine years from April 1, 1935. If the duty is put at any figure between 8d. and 4d., the preference and the period during which it operates will be adjusted accordingly.

The hydrogenation experiments which have been carried out by Imperial Chemical Industries, Ltd., have long attracted scientific minds, and even apart from commercial and patriotic considerations there will be universal desire that they shall enjoy the reward which their enterprise in this matter so well merits.

Weymouth's Enterprise

MUCH public attention was drawn to Weymouth last week by two events which mark the progressive outlook of those responsible for the activities of the town, and one of these events was of especial concern to readers of the "JOURNAL." The opening by the Prince of Wales on Thursday of a big pier and harbour extension scheme was preceded a day earlier by fitting celebration of the successful completion of an enterprising project undertaken in the interests of their service to the town by the Weymouth Consumers' Gas Company. We are told that the earliest evidence of Weymouth as a town is to be found in the records of about a thousand years ago. The Gas Industry cannot point to a history of this length, but both town and industry share the secret of perpetual youth. Nearly six hundred years ago Weymouth sent ships and men to assist in the siege of Calais, and later it had its share in harassing the Spanish Armada; while the part taken by the town (and by Melcombe Regis, which is now united to it) in the Great War was full worthy of its past. Long may it be ere this historic spot is called upon again for like patriotic effort and like noble sacrifice. Now Weymouth has its attention upon enterprises of peace, of a magnitude and of a character in keeping with all that has gone before. In looking back upon the past, the town derives courage to look forward into the future.

For nearly a century Weymouth has enjoyed the countless advantages of a gas supply, which may be included among its amenities along with the town's proud boast of possessing one of the safest bathing bays in the country. In 1867 the Gas Company was incorporated under its present title, and since then the operations have increased in magnitude every year without exception. In the past twenty years the output of gas has almost doubled, and there has been a heavy increase in the number of consumers. These facts necessitated measures to cope with the growing demand, and it was the completion of the works thus called for that was marked on Wednesday last in the manner fully detailed on later pages of this issue of the "JOURNAL." A special point about the new works is that they have been constructed upon land reclaimed by the Gas Company from 3 acres of mudflats that were purchased from the Corporation five years ago. At high tide the site was covered by tidal water over 8 ft. deep, and more than 90,000 tons of filling was used to build the reclaimed land to the requisite level. The whole of the work (which we describe and illustrate to-day) was carried out to the design, drawings, and specifications prepared by the Company's Engineer and Manager, Mr. J. T. Joyce, and comprises a horizontal retort house and retort bench unit capable of producing 1,000,000 c.ft. per day of 500 B.Th.U. straight coal gas from unscreened Wearmouth coal, complete with stage floors, Congdon mountings, Fiddes-Aldridge charging machine, coal and coke handling plant, &c. From the large number of guests who were assembled at the opening there was nothing but commendation of the scheme, of the way in which it has been carried out, and of the appearance of the works generally.

Before leaving this matter, there is one other point mention of which should not be omitted—namely, the cordial relationship existing between the Corporation and the Gas Company. This is as it should be. The Gas Company are engaged in efficiently providing an essential public service, and so are benefactors of the town. This is recognized to the full in Weymouth, and a striking feature of last week's opening function was the attendance, as shown in our photographs, of the Mayor, members of the Corporation, and officials in their robes of office to take part in the proceedings. Those present included the Chairman and various members of the Weymouth Electricity Committee and the Borough Electrical Engineer. Mr. M. C. Frowde, the Chairman of the Company, referred with gratification to the fact that, though competition is keen, it is nevertheless possible for these friendly relations to exist between the Corporation Electricity Department and the Company. It is, of course, in this way that each is enabled to regulate its own affairs to the best advantage of those concerned.

Another Step Forward

WE had further evidence last week of the enterprising spirit of Radiation Ltd., when, as recorded on later pages, Sir David Milne-Watson opened a new Research Kitchen at Radiation House. This Kitchen is an admirable demonstration of what can be done by careful planning to make a bright, healthy kitchen equipped with the most up-to-date gas apparatus, and it will prove of great value to the Gas Industry as a whole as well as to the firm of Radiation.

Readers will doubtless have noticed that National newspapers are appending to their cooking recipes on the Women's Pages the "Regulo" settings and cooking times; and as these recipes are often contributed from sources other than Radiation themselves, it became necessary to make arrangements for the recipes to be

properly tested—in most cases with hardly any margin of time. These and other circumstances reinforced the firm's decision to undertake the laying-out and fitting of a Research Kitchen adequate to deal with the growing significance of this side of Radiation work. Certainly the result is excellent, and the project has our best wishes. The new Kitchen represents in all respects the most modern ideas of construction and fitting; and we are glad that opportunity has been taken to demonstrate the gas cooker's complement—the gas water heater. Apart from the worth of the research undertaken in the new Kitchen, its publicity value is sure to benefit our Industry.

Public Gas Lighting to the Fore

WHEN reviewing a few weeks ago the 1932 issue of "Field's Analysis," we took occasion to remark upon the importance of public lighting, inasmuch as to-day the use of gas for this purpose very nearly approximates, per lamp, to the average sale to a prepayment consumer. It is because of our keen appreciation of the importance of this side to the Industry that we always welcome so cordially demonstrations of the high regard in which gas is held for street lighting purposes.

There are gratifying announcements of this character which we are at the moment able to record. The Paddington Borough Council have decided to renew their contract with the Gas Light and Coke Company in respect of public lighting for a period of fifteen years from Oct. 1 next—among improvements included in the new arrangements being the fitting of automatic clock controllers for lighting and extinguishing. Also, the Southwark Borough Council have determined to renew their contract with the same Company for a period of ten years. Going further afield, we learn that the Ross Gas Company have just secured a seven years' contract for the lighting of their town in face of keen electrical competition.

Purging of Holders

NEARLY four years ago the American Gas Association outlined a procedure for purging and placing gasholders into service or removing them from service. The report then issued has been superseded by a new report, which, it is believed, presents the best knowledge and the broadest experience in such operations available at the present time. A copy can be inspected in the Library of the Institution of Gas Engineers, 28, Grosvenor Gardens, S.W. 1, and we feel sure it will be read with interest by members.

The procedure recommended in the new report applies to a holder containing air which is to be placed into inflammable gas service; and a holder containing gas which is to be withdrawn from service. To prevent any mishap, the Association lays down five fundamental requirements. Competent supervision; positive isolation of the holder from the admission of air or inflammable gas until the purging operation has been completed; an adequate supply of inert gas; displacing the contents of the holder with the inert gas and then replacing the inert gas with inflammable gas or air, as the objective may require; a reliable means of determining when the contents of the holder are substantially free from oxygen or inflammable gas or vapours. "These requirements are the backbone of safe procedure, and there is no substitute for any of them, though there may be alternatives to the details described." Specific procedure is recommended for purging and placing into service, and removing from service, water-seal holders, waterless holders, and pressure holders.

Whatever the type of holder, the contents should first be tested to determine the character of the atmosphere contained therein, and it is advisable that the operation should be carried through continuously and completed within the daylight hours. Also, the purging should not be conducted in a spirit of haste, and safety should not be sacrificed to time, convenience, or expense. However, no additional safety is secured by unnecessarily prolonging the operation. Standard vents are detailed, and these vents, with the valve fully open, should be of sufficient size to discharge the purge gas without building-up more than 1 in. of water pressure within the holder. Of course, precautions should be taken against all sources of ignition in the immediate vicinity of the holder, and purging should not be undertaken during an electrical storm. A competent gas analyst should be present throughout to determine the quality of the inert gas and of the contents of the holder.

The report contains a great many useful practical hints on such matters as avoiding by-passing and saving time. With large water-seal holders—4 million c.ft. and over—several hours may be saved, when putting the holders into commission, by closing up the tank overflows and raising the water to the top of the tank, thus reducing the volume of air to be purged out. When such holders are provided with seal bonnets, raising the level of the tank water may require either installing a full-size by-pass or attaching the inert gas connection to the crown. Full particulars are given for dealing with the M.A.N. and Klönne types of waterless holder; and in connection with pressure holders it is advised that with horizontal cylindrical tanks, when the connection for admitting the inert gas is located midway between the ends of the tank, a standard vent should be provided on top of the holder near each end, the test cock being placed midway between the vents. When the connection for admitting the inert gas is located at one end of the tank, a standard vent should be provided on top of the holder at the opposite end, and the test cock should be placed on top of the holder about one-third of the length of the holder from the inert gas connection.

Greater care has, of course, to be exercised when a holder in commission has to be placed in such a condition that internal repairs, reconstruction, or demolition can be safely carried on. With water-seal holders, for example, inflammable gas is dissolved in the tank water, and the interior surface of the tank water may be covered with drip oil, drip oil emulsion, or both, and, further, the water may contain an emulsion of volatile oils in suspension below the surface. Here, again, the method of procedure, the use of inert gas and steam, and so on, for the different types of holder is detailed and ought to be carefully studied. In this section attention is called to the particular difficulties connected with the purging of old holders. Particularly in the case of holders having masonry tanks, rubbish and solid matter of considerable stability may have accumulated beneath the inner section, to a height of several feet above the bottom, in which case the cup of the inner section may be badly damaged upon deflating the holder. Because of their frequent landings the outer sections of a holder usually prevent the formation of such obstructions to their being landed. The actual conditions should be ascertained by sounding with a long rod. In most instances the obstructions may be dislodged either with a long-handled rake or with a water jet, though on rare occasions dredging may be necessary. Of course, if the purpose of purging is to dismantle the holder, the obstructions in the bottom of the tank, if any, require no attention.

Appendices to the report—the practical utility of which will have been gathered from the foregoing—deal with combustible gas indicators, testing inert gas mixtures, quality and sources of inert gas, and the special procedure essential when inert gas is supplied by an intermittent type of apparatus.

PERSONAL

On Monday, July 10, a presentation was made to Mr. FRED BETLEY on the occasion of his retirement from the position of Engineer and Manager to the Wigan Corporation Gas Department. Mr. Betley had given 50 years' service to the Corporation. At the July meeting of the Town Council a resolution was adopted placing on record the Corporation's appreciation of the work of Mr. Betley to the Gas Undertaking of the Corporation during his long period with them, and more particularly during the 21 years he had occupied the position of Gas Engineer and Manager, in which period many important improvements had been made at the gas-works, including the re-organization and modernization of the plant. The Council recalled with satisfaction that although the capital expenditure in connection with the Corporation's Gas Undertaking was £473,064, the outstanding debt amounted to only £45,218, and they felt that this eminently satisfactory position was due, in no small measure, to Mr. Betley's good and careful management, as well as to the fact that most of the improvements in the plant had been paid for by means of a renewals fund rather than by means of loans.

* * *

Mr. WALTER WILLIAMS, Chief Chemist and Technical Assistant to the West Bromwich Corporation Gas Undertaking, has been appointed to the position of Gas Engineer and Manager to the Tipton (Staffordshire) Urban District Council. Mr. Williams served his articles to Mr. W. H. Johns and the late Mr. J. W. Allin, former Managers of the West Bromwich Gas Department, and on completion of his indenture was appointed to a position on the technical staff. Recently he had been carrying out the duties of Chief Assistant under the direction of Mr. D. Green, who is acting as Borough Gas Engineer and Manager.

* * *

Mr. ARTHUR SAINSBURY, of Devizes, Wilts., for many years a Director and Secretary of Messrs. Ewart & Son, Ltd., of Euston Road, London, left £24,326, with net personalty amounting to £22,239.

The freedom of the Borough of Morpeth has been conferred upon Major RALPH CRAWFORD in recognition of his public services. Major Crawford, who is the fourth Freeman of the town, is Chairman of the Morpeth Gas Company, with which he has been connected for many years. The Centenary Brochure of this Company, which was edited and compiled by Major Crawford, is referred to on another page of to-day's "JOURNAL."

Correspondence

Mr. George Evetts' Institution Paper.

SIR,—I shall be grateful if you will kindly publish the statement below in reply to the doubt expressed by Mr. George Evetts concerning my remarks in the discussion on his Institution Paper. The doubt expressed refers to the price of gas in relation to the price of coal, and my comment did not refer to the high price of gas, as at the time of discussion my mind was on the relationship between the gas producer and the gas user. Therefore, the remark was irrelevant as far as agreement between gas producer and gas retailer is concerned. At the time of discussion a full appreciation of the significance of the gas consumer as a retailer was not realized.

I should be glad, also, to take this opportunity of expressing the view that, as the capital costs of both the pipeline and the gas-producing plant are relatively low, it would be of great interest to the Gas Industry to have information in two or three years' time as to the maintenance charges incurred. This, it seems, would be a further valuable contribution to our immediate needs. There is very little information available concerning the upkeep of coke ovens which is procurable by any but those bounded by the activities of the coke oven industry.

Yours, &c.,
R. J. RESTALL,
Engineer and Manager.

Gas-Works, Stalybridge,
July 14, 1933.

THE NEWS OF THE WEEK

New Holder for Burton-on-Trent.—The Burton-on-Trent Gas Committee have recommended the erection of a new gasholder at a cost not exceeding £14,000.

North British Association.—The Annual General Meeting of the North British Association of Gas Managers will be held in the Clark Town Hall, Paisley, on Thursday, Sept. 7, 1933, and the usual excursion will take place on the following day, taking the form of a cruise in the T.S. "Duchess of Argyll." Other attractive social activities have been arranged for the meeting.

The Annual Outing of the employees of Dougall's Gas Meters, Ltd., on Saturday, July 15, took the form of a visit to the Isle of Wight, where luncheon was served at Leoni's Restaurant, Ryde, Mr. R. V. Steed (Managing Director) presiding. The toast of "Success to the Firm" was proposed by Mr. G. Sage and responded to by the Chairman. Some 40 members of the firm were present, and after luncheon a good number of them made a tour of the island.

A Proposal to Purchase the Sunderland Gas Company has been brought before the Sunderland Town Council by Councillor Summerbell, who has suggested that a special committee of 15 members should be appointed to consider the matter. Councillor Bowey has also proposed that the municipalization of the undertaking should be entered on the agenda for the next Council meeting and that the Town Clerk and Borough Treasurer be requested to report as to the legal and financial position.

The Second Annual Outing of the Stroud Gas Light and Coke Company's Social Club took place on Saturday last, July 15, when, through the kindness of the Parkinson Stove Company, a visit was arranged to their extensive and up-to-date works at Stechford. The party of 54 was welcomed on arrival by Mr. R. J. Rogers, Managing Director of the Parkinson Stove Company, following which a tour of inspection of the works was made, and after an interesting morning, lunch was partaken of at the invitation of Parkinsons at the Bull's Head Hotel. The afternoon was spent at cricket and bowls. Tea was provided by the Social Club, and following a short stay in Birmingham the party returned to Stroud after a very enjoyable day's outing. Credit is due to the Secretary, Mr. F. H. Smith, for the excellent way the outing was organized.

Major Geoffrey H. Kitson (Chairman of the Gas Committee), addressing the Leeds Women's Conservative Association on July 6, forecast the likelihood of a rapid development of the use of gas as a fuel for transport. He spoke of the success of experiments made up and down the country, of the fact that gas-driven wagons had already visited Leeds, and felt certain that within the next two or three years big developments would be seen in this service by gas. Commenting on the Gas Industry generally, Major Kitson said it was now on the up grade and finding new outlets for its product. Every time gas extended its business it passed a benefit of more work to the coal trade and the miners. As two examples of expansion at Leeds, he mentioned the decision to introduce a new benzole plant at the Meadow Lane works and important alterations to large mains serving Middleton and Osmondthorpe districts.

An Exhibition of Household Equipment, organized by the Household Service League Exhibition Committee of the National Council of Women of Great Britain, is to be held at the Institute of Hygiene, 28, Portland Place, W., on July 20 and 21. The Exhibition will be formally opened by Mrs. W. H. Ward, M.P., and Sir Francis Goodenough, C.B.E., and in the course of an interesting and varied programme, cookery lectures are to be given by Miss Beresford and Miss Lydall, Gas Light and Coke Company demonstrators.

Petrol from Coal.

Government Aid for New Industry.

A statement made in the House of Commons by the Prime Minister on Monday foreshadows what it is hoped may prove the means of enabling coal once again to play a part approaching its old importance in the country's industrial economy, and also of assuring the country, in case of necessity, adequate supplies of petrol and fuel oil from its own resources.

The Government's decision is to give active support, by a guaranteed preference of 4d. a gallon, to the manufacture of petrol from British coal, shale, or peat; and the first plant, when completed, will, it is estimated, consume 350,000 tons of coal a year, giving employment to 1000 miners; produce 30 million gallons of petrol, and provide work, directly or indirectly, for nearly 14,000 men. It is believed that this plant will cost in the region of £7,000,000, and will be erected at Billingham, near Middlesbrough, by Imperial Chemical Industries, though the Directors of this concern refuse to make any statement on the subject until the terms of the Government's proposed guarantee are made known.

Mr. MacDonald made his statement in the House of Commons in reply to a question put by Sir Adrian Baillie (Con., Linlithgow). He said:

> The Government have decided to give effect to a proposal which they have reason to believe will ensure an immediate advance on the manufacture of home-produced motor spirit. The proposals will take the form of a guaranteed preference at the rate of 4d. a gallon in respect of light hydrocarbon oils, as defined in the Finance Act, 1928, manufactured in this country from indigenous coal, shale, or peat, or from products derived from those substances.
>
> The guarantee will be for a period of ten years from April 1, 1934, provided that if the Customs duty for any financial year after March 31, 1935, exceeds 4d. a gallon and no excise duty is imposed for that year, or if for any year the Customs duty exceeds any excise duty by more than 4d. a gallon, then, in respect of each such year the period of guarantee will be reduced by three months for each penny of excess.
>
> The effect of this arrangement is to vary the period of the guarantee according to the actual preference, that is the difference between the Customs duty and the excise, if any excise duty should be imposed.
>
> If the preference remained at its present level of 8d. a gallon, the period of the guarantee would be 4½ years, from April 1, 1935. If it was reduced to 4d. a gallon the period would be nine years from the same date. Any intermediate rate of preference would vary the period of guarantee proportionately.
>
> Legislation to give effect to the guarantee will be introduced in the autumn.

This decision on the part of the Government has been reached, it is understood, on the advice of the Fuel Research Board and in consultation with the commercial interests concerned.

New Scale of Charges at Bath.

The following scale of charges has just been introduced by the Bath Gas Company to take the place of their previous flat rate of 5½d. per therm.

		Pence.
Up to	120 therms per quarter	5·5
Next	1080 ,, ,, ,,	4·5
Next	1200 ,, ,, ,,	4·0
All over	2400 ,, ,, ,,	3·5

These prices are net and supersede all existing contracts and discounts. Consumptions in separate premises occupied by the same consumer are not to be combined for the purpose of charging.

THE NEWS—continued.

A Hundred Years of Gas at Morpeth.

Centenary Brochure.

The Morpeth Gas Light Company celebrated its hundredth anniversary in April last [see "JOURNAL" for May 3, p. 265], and in commemoration of this event a Centenary Brochure has been published—edited and compiled by Major Ralph Crawford, Director of the Company since 1899 and Chairman since 1901.

To recapitulate briefly the history of the Company, this was constituted by trust deed on April 24, 1833, with a capital issue of £1200, divided into 120 shares. At the start the subscribers numbered 39, and from the records one subscriber made himself responsible for six shares, £60. With that small capital the Company erected plant and works and a cottage for the foreman workman (costing £41) at a total expenditure of £1193 6s. 5d., leaving only a little over £6 to carry on the undertaking. The capital of the Company is now £30,967, and during the past year the output of gas was 42 million c.ft., an indication that the Company has made remarkable progress, in spite of keen competition, for a small country town of 8000 inhabitants.

The brochure, which is attractively illustrated by photographs, past and present, of the town of Morpeth, by portraits of officials and members of the Company, and by excellent reproductions of etchings of pioneers in the Industry, sketches at the outset the origin and development of the Gas Industry, and visualizes the condition of things as they existed in Morpeth at the time of the foundation of the Company. The writer recalls how the founders of the Company have been severely criticized for having erected the works where they did, instead of in juxtaposition to the railway; and points out that these sapient critics ignore the fact that the railway did not come to Morpeth until fourteen years after the Company was formed.

THE BUILDING OF THE WORKS.

The formation and early history of the Company are then dealt with, and the first report, dated July 1, 1834, stated that the most important part of the works had been completed for the sum of £955 5s.; for supplying and laying down the pipes the cost was £166 15s. 5d.; for the building of a cottage £41 was paid (the writer wonders what sort of a cottage it was); while after other sundry expenditures there was a sum of £6 13s. 7d. left for working capital.

That the Directors did not splash the Company's money about unnecessarily, says the writer, is shown by the fact that they paid the gentleman whom they dignified by the name of Manager, a part-time job evidently, an honorarium of £10 per annum, while their foreman of the works, who, we take it, must have really been the man responsible for the making of the gas, was paid 18s. per week, being thereby made "passing rich" by a little more than £40 a year. The Directors themselves were not paid any fees, and it was not until 1852 that it was decided to allow them £2 worth of gas free, provided they attended two-thirds of the meetings of the Directors; later it was decided to allow them 6s. 8d. per meeting, half of it to be taken out in gas. During the first year there were 42 Directors' meetings. Although the Directors did not receive any fees they had suitable refreshments, for in the accounts there appeared sundry payments, quite modest ones be it said, for "Tavern expenses." Nor were the workmen forgotten, as there were frequent items in the accounts for "ale for the workmen."

The continued prosperity and progress of the Company is traced in the brochure with many interesting facts and entertaining anecdotes up to the present day, while, in conclusion, a full report is given of the Centenary Dinner which was held at the Queen's Head Hotel, Morpeth, on April 24 last, when a very representative company assembled, including the Mayor and other officials of the Corporation.

Gas Production in Edinburgh, 1816-1933.

In the *Edinburgh Evening News* of June 24, the second of a series of articles on "How the City is Run" dealt with gas production in Edinburgh from the earliest times up to the present day, when the Granton works send out 5,369,239,000 c.ft. of gas per annum.

Gas was first produced and used, stated the article, by a Scotsman, William Murdoch, in his house at Redruth, Cornwall, in 1792. In 1807 Pall Mall was lighted by gas, and seven years later London took up the manufacture of gas seriously. Edinburgh, be it said to her credit, was only two years behind the Metropolis, and 1816 saw the formation of the Edinburgh Gas Light Company. Works were

THE NEWS—*continued.*

constructed in New Street, and these remained in use until the final move to Granton in 1906.

The public, surprisingly perhaps, took gas to their bosoms, and as there appeared to be money in gas, opposition arose. Two new companies were launched, Sir Walter Scott being Chairman of the Edinburgh Oil Gas Company (1824), which was absorbed by the senior company in 1829. The result of this rivalry was that duplicate pipes ran everywhere, and the streets were continually being torn up. It is even said that cunning workmen frequently connected a customer's service pipe to the other company's main.

In 1888 the two companies were bought up by the municipalities of Edinburgh and Leith, and the Gas Commissioners were incorporated by Act of Parliament. There were then two works, at New Street and Baltic Street, but when the Portobello Gas Light Company's works were acquired in 1896 they were closed down and their customers supplied from Edinburgh. Mr. W. R. Herring was then appointed Engineer over the whole concern, and it very soon became apparent, with Edinburgh steadily growing, that a works of much greater size was essential.

The Move to Granton.

A site of over 106 acres was bought at Granton, from the Duke of Buccleuch, which was ideally situated, being adjacent to Granton Harbour and having direct service on two railway lines. Here, to designs prepared by Mr. Herring, there gradually rose one of the most perfectly laid out and completely equipped gas-works in Britain. The first scheme cost £842,000, this part being completed in 1905, and extensions caused by the need for a much greater supply, and, consequently, another retort house costing £250,000 was opened in 1926 by the Duke and Duchess of York. It was then found necessary to provide more storage accommodation, and the 5-million c.ft. waterless gasholder, which is a landmark for scores of miles all round, was built at a cost of £65,000.

Figures are more impressive and enlightening than columns of description. Here are a few for last year of the many available concerning gas, those in brackets being for 1923, to show the progress in nine years: Gas made—3,369,239,000 c.ft. (2,499,218,000); gas sold—ordinary consumers, 2,211,761,581 c.ft. (1,849,262,000): by prepayment meters—548,728,958 c.ft. (202,724,950); for trade purposes other than lighting—280,224,143 c.ft. (177,622,600); public lamps—92,278,610 c.ft. (59,050,150); make per ton of coal—14,835 c.ft. (11,765); number of customers—121,145 (109,153); average price of gas per 1000 c.ft.—2s. 10·5d. (4s. 1·8d.); length of mains—542 miles (457¼); coal used—227,110 tons (212,434).

Insurance of Street Lamps.

At the July meeting of the Walton and Weybridge Council the Acting Clerk reported on the cost of repairing and replacing damaged street lamps in the Walton district during the past financial year, but that he had not yet been able to obtain particulars as to the cost of insuring against such damage. It was agreed that the matter should be discussed further when the Acting Clerk was in a position to submit particulars as to the cost of insurance.

It was reported that in making claims for damage to street lamps it had become a common practice for Insurance Companies to offer half the amount of the claim, without prejudice, in full settlement. The Highways Committee recommended that the Council should not accept less than the full amount of the cost of repairing and replacing damaged street lamps.

New Company Registrations.

In their half-yearly statistical report relating to new companies registered in England during the half-year ended June 30 last, Messrs. Jordan & Sons, Ltd., Company Registration Agents, of 116-118, Chancery Lane, W.C. 2, state:

"In our last statistical summary (for the whole of 1932) we recorded the astonishing fact that, although the year had been one of almost unparalleled depression, the number of new companies registered had broken all records.

"Judging from the figures for the first half of 1933, last year's record of total registrations appears likely to be beaten. The figures now available indicate increases in every respect except in the total capital of 'private' companies.

"The most striking improvement in the period now under review, as compared with January-June, 1932, is the jump from £5,254,458 to £16,046,275 in the capital registered by 'public' companies, while the numerical increase from 108 to 155 is also noteworthy. The aggregate capital of such companies in the whole of 1932 was only £17,858,458, and the companies only numbered 255. While, as just stated, there is an increase of £10,791,817 in the capitals of public companies, the increase in capitals of all classes of companies is only £8,268,413, the difference being accounted for by a drop of £2,523,404 (from £28,803,098 to £26,279,694) in the total for 'private' concerns. The number of private company registrations is up by 500 (4985 to 5485). The total of all companies registered is up by 547.

"It cannot be claimed that the increases in the 'public' company statistics are attributable wholly to reviving trade, as the easing of the embargo on new issues has to be taken into account, but it may be hoped that they represent an indication of revival."

Gas and Water Securities, Ltd.

Mr. George Evetts, Mr. G. M. Gill, and Mr. Julian Day comprise the Board of Directors of a recently registered private company entitled Gas and Water Securities, Ltd.

This concern, whose registered offices are at 15, Moorgate, London, E.C. 2, and whose Secretary is Mr. C. P. Daunay, has a nominal capital of £100,000 in one pound shares, and its chief objects are to acquire and hold shares, stocks, debentures, &c., issued or guaranteed by any public utility, general, or other undertaking or company in the British Isles; and to promote British or foreign companies. In addition, the Articles enable the Company to manufacture, sell, and supply gas for all purposes in any part of the world, to erect works, and to manufacture and deal in residual products, &c. As well as being in a position to carry on the business of water undertakers and electricians, they are enabled to become shipbuilders and owners, wharfingers, and carriers by land, sea, or air.

The Solicitors are Messrs. Slaughter & May, 18, Austin Friars, E.C.

"Destructive Canker of the Age."

Striking instances of the damage caused to buildings and monuments by atmospheric pollution were given by Sir Frank Baines, the Architect, in an address at the summer meeting of the National Smoke Abatement Society in London on Friday last.

Sir Frank Baines described atmospheric pollution as the destructive canker of our age and one which will finally render unintelligible the readings of history in all our national monuments. The excess cost due to making good the results of atmospheric impurity to our buildings for the whole country could be placed at a minimum figure of 55 to 60 million pounds sterling during the last quarter of a century. Since that estimate he had looked into the figures further, and he was convinced that the actual damage, if carefully calculated from all sources, would probably be found to be far in excess of these figures. Was it not amazing, therefore, that losses of this magnitude, falling upon the nation generally—with certain of such losses irreparable and irreplaceable by the mere expenditure of money—should be faced with such equanimity, while at the same time methods of prevention were attacked on the score of the cost of their institution?

Describing his researches into the decay of the stonework of the Houses of Parliament, Sir Frank said, "The main cause for the condition of this building is definitely atmo-

spheric impurity, although it was rendered vastly more serious owing to primary faults in the stone. The first stone was laid in 1840, and evidences of decay were discovered before the building was completed. An attack so pronounced as this, which became increasingly progressive during the 10-year period when I had the building under close observation, would hardly go to show much amelioration in the condition of atmospheric purity; while further direct evidence existed to show that repairs in the building which had taken place within quite recent years were almost as subject to the same destruction, arising from atmospheric acid attack, as the original stone in the building. I found the presence of sulphate—which could only have been derived from the attack upon the stone by atmospheric acids—in cracks and fissures as much as 20 in. from the surface, with the result that crystallization occurring at such depths had thrown off great pieces of stone to such an extent that even in a short and rapid summary inquiry into the case over 35 tons of such pieces of stone were picked off portions of the building by hand without touch of tool or hammer, while some pieces lifted by crystallization were over 2 tons in weight."

Effect on Monuments.

Speaking of the Nurse Cavell Memorial, Sir Frank Baines said the regulation cleaning of four times per annum had been increased to six, but he had come to the conclusion that the dingy yellow discoloration would spread slowly over the whole of the marble work, and that it was due to atmospheric impurity. At Sandon, five miles from Stafford, the stone of the war memorial was blistered, with definite eruptions and burst surfaces which left irregular shaped holes.

Instancing the widespread nature of atmospheric pollution, Sir Frank Baines said that attention had been drawn to the black fringe of soot often to be found on Coniston Lake and the large sooty concentrations which might be observed any day in winter on the lake in St. James's Park, London. The deposit of solid matter and sulphates varied very greatly in different parts of the country. The maximum solids were found at Ashington observation station with 61·58 tons per square mile for the year 1931-32. The minimum was recorded at Leicester with 7·22 tons, but another Leicester station recorded 31·03. The maximum sulphates were found at Ravenscourt Park, with a measurement of 8·72 tons, and the minimum at Southport with 0·82.

Sir Frank said that, while legislation was tentatively reaching out in an endeavour to deal with what was felt to be controllable factors of smoke emission—factories, power stations, and large industrial units—Parliament was not prepared to deal with the critical problem of the domestic fire or the very destructive sulphur gases. Local and municipal bodies were taking an increased interest in planning restrictions to eliminate some part of the nuisance. He paid tribute to the work of the National Smoke Abatement Society in calling conferences of local authorities to arrange for formation of area committees.

Mr. R. J. Schaffer, of the Building Research Station, said that that department was engaged in a special study of the weathering of building stones, so that ultimately the selection of materials and the application of methods for minimizing decay might be found on a sound and reasonable basis. The efforts of industrial concerns and municipal authorities to limit industrial smoke could not achieve more than a partial cure because the domestic fire was to be considered of as much consequence as the industrial furnace.

High-Temperature Studies in France.

Under the auspices of the municipal council of Paris and as the result of a subsidy granted by the Société du Gaz de Paris, a Chair of High-Temperature Studies has lately been established at the Faculty of Sciences of the University of Paris with the object of creating a body of physicists and engineer specialists in high temperatures.

The first occupant of the chair is Prof. Ribaud, who, in his inaugural address lately given at the Sorbonne, stated that the course of instruction would be both theoretical and practical, the former being taken at the Sorbonne and the practical side in the laboratories of the Société du Gaz de Paris.

The full syllabus has not yet been completed, but it will embrace the study of high-temperature scales, the physical properties of incandescent bodies, the attainment of high temperatures, and general industrial pyrometry.

Taxation of Public Utilities.

Referring to the taxation of public utility undertakings, *Gas Logic*—the organ of the Consolidated Gas Company of New York—states that taxes on the gas and electric companies in this group in 1932 were equivalent to a charge of $4·72 against each customer's gas meter and a charge of $9·95 against each customer's electric meter.

"High taxes on public utilities," the writer remarks, "are no relief to the individual. Gas and electric utilities become, in effect, tax collectors for government. Taxes paid by the companies are recognized as a necessary part of their operating expenses and as such have to be provided for in the rates for gas and electric service. When additional taxes are laid on utility companies, coincident with a demand for lower rates, a situation is created detrimental alike to the interest of the company and the interest of the public. Such a situation exists to-day in this city and in many others.

"There is an old political axiom—The power to tax is the power to destroy. There seems to be prevalent an idea, however mistaken, that public utilities have suffered no loss of business and revenues in the last few years and that they can and should be taxed above and beyond other businesses.

"Utility companies cannot long pay out increasing taxes from present rates—they certainly cannot long pay increasing taxes out of lower rates producing less revenue—without endangering their financial stability and the high quality of service they supply."

Coke Salesman and Corruption Charge.

Before the Tottenham Magistrates recently, Edward Marvin, of Stoke Newington, was summoned by the Tottenham and District Gas Company for corruptly giving gifts to Percy Jeffery, an employee of the Company, as an inducement or reward for doing an act and showing him favour in relation to the Company's affairs.

It was stated that the proceedings were brought under the Prevention of Corruption Act.

William Hawkyard, Works Engineer at the Company's Willoughby Lane depôt, said on Feb. 28 he kept watch on defendant's lorry, which was heavily loaded. It was driven on to the weighbridge and the clerk handed him a ticket. Witness stopped the lorry and looked at the ticket, which bore the words "25 sacks, weight 1 ton, 5 cwt." Witness ordered the lorry to be re-weighed. It was found that the weight was two tons, 1 cwt., and that there were 41 sacks on the lorry instead of 25.

Percy Jeffery, of Edmonton, who at the time was employed as weighbridge clerk, said early in 1932 Marvin gave him 5s. and said, "Here is five shillings, and I will see you all right each week." Subsequently, Marvin gave him 5s. every Friday or Saturday, and on one occasion 10s. At Christmas he gave him some cigars. He (witness) understated on the tickets the weights of the loads and the number of sacks.

Questioned, witness said he had allowed Marvin to take his lorry into the yard late on several occasions, and also had let him go in without taking the tare weight when traffic was congested.

Marvin said he had taken, in all, about two thousand tons of coke from the Company. He had been giving Jeffery tips because he was a very good fellow, and had let him into the yard late to get loads. He had not an arrangement with him to understate his weight, and in fact had said nothing to him. He had never given him a box of cigars.

Asked about the sums of five shillings, Marvin said they represented tips of about sixpence in respect of each load, which he had not given to Jeffery each time, but had saved for him.

Defendant was fined £25 and ordered to pay £5 5s. costs.

Successful Year at Selkirk.

The Selkirk Gas Company has had a most successful year, a total of 54,586,300 c.ft. of gas having been consumed—a large increase on previous years. This increase was attributed to the reduction in price of 2½d. per 1000 c.ft. last year. Sales of bye-products, coke, and tar had also greatly increased during the year. The Directors declared a dividend at the rate of 6%, free of income-tax.

THE NEWS—continued.

Opening of New Sports Ground for Plymouth Company.

Chairman Presented with Memento of Occasion.

The new sports ground at Longbridge of the Recreation Club of the Plymouth and Stonehouse Gas Company, which when completed will rank as one of the best in and around the city, was formally opened on Saturday, July 15, by the Chairman of the Company, Col. R. L. Norrington, who was presented as a memento of the occasion with an inscribed silver salver, while the Engineer, Mr. R. J. H. Clark, received an inscribed silver cigarette box.

The Club's annual sports were held the same day, and several good performances were witnessed. For example, G. Monson lowered the club one hundred yards record, besides winning the one hundred yards hurdle, the two hundred and twenty yards flat, and the long jump, while G. Murray broke the Club record for the mile.

The awards were distributed by Mrs. Clark, while the arrangements in connection with the meeting were made by the Hon. General Secretary, Mr. R. Lucas.

BOOK REVIEWS

SAMPLING AND ANALYSIS OF COKE.*

The British Standards Institution have just issued a British Standard Specification for the Sampling and Analysis of Coke. The minimum weights of gross samples specified have been determined after extensive trials on both oven and gas coke.

The basis of the specification is the same as that used for small coal (see Report on the Sampling of Small Fuel, by Dr. E. S. Grummell and Dr. A. C. Dunningham, B.S.S., No. 403-1930)—viz., to determine the variability of the coke, and, from the theory of errors, to calculate the number of increments necessary for a specified degree of accuracy.

The moisture content of coke was chosen as the most variable factor, and, by determining this separately in fifty increments, the average deviation from the mean (the average error) was found. This was done with cokes of different average moisture content and with different weights of increment.

It was found that the average deviation from the mean increased until the moisture content was 8 or 9%, when it attained a constant value for higher moisture contents up to a limit, as shown by the tests, of 15%. The results obtained with increments of 1 lb. were not generally satisfactory, but concordant results were obtained with increments of 2½ lbs.; and as a consequence a weight of increment of 2½ lbs. has been adopted in the specification. The number of increments required to give a degree of accuracy such that in 99 cases out of 100 the moisture content of the sample will be within ±1 unit of the true moisture content—that is, the average moisture content of the consignment—was calculated from the results of the tests.

Since the variability of the moisture content of coke throughout a consignment depends largely on the proportion of different sizes of coke at the point of manufacture (small coke retaining more water during quenching than large coke), as well as on the proportion of water in the coke, provision has been made for the sampling of two classes of coke as follows:

Class 1. Screened or unscreened coke containing not more than 10% below 2 in. at the place of manufacture, and not more than 5% of moisture; graded coke (*e.g.*, coke nuts, cobbles, &c.).

Class 2. Other cokes.

The variability of the ash content of coke is less than that of the moisture content, except when the moisture present is about 1%. For coke containing 2% or less of moisture, the minimum number of increments required to obtain a satisfactory representative sample has been fixed at 20, and this number of increments is also sufficient to ensure a satisfactory sample of ash, sulphur, and volatile matter. In all other cases the number of increments required for correct sampling for moisture more than covers the requirements for sampling for ash, &c. It was considered advisable to specify one method only for the sampling of coke for moisture, ash, sulphur, volatile matter, and other constituents.

The particle size to which coke may be crushed without loss of moisture, the minimum weight of sample to be taken for moisture determination, and the particle size to which coke may be crushed before sampling for ash have also been determined by extensive trials.

Methods of analysis included in the specification cover the determination of moisture (both in the air-dried coke and in the coke "as received"), volatile matter, ash, calorific value, sulphur, and arsenic, together with such physical tests as the shatter test, bulk density, and true specific gravity.

A considerable amount of experimental work has also been carried out in connection with the determination of the apparent specific gravity of gas and oven coke, but the results show that this property varies so considerably from piece to piece from the same batch that no simple laboratory method applicable to all types of coke can at present be recommended.

After very careful consideration, therefore, it has been decided that the subject shall receive further consideration before a standard method can be included in the specification.

The use of this specification should reduce the disputes which frequently occur between buyer and seller, owing to the use of unsatisfactory methods of sampling and analysis. Its use should also facilitate the sale of coke to specification, in which bonus and penalty clauses would encourage the production of finer and better cokes. The production of cokes of better quality would encourage the scope of their usefulness and so allow the production to be developed.

Copies of this specification may be obtained from the Publications Department, British Standards Institution, 28, Victoria Street, London, S.W. 1, price 2s. 2d., post free, or from the Secretary of the Institution of Gas Engineers, 28, Grosvenor Gardens, S.W. 1.

* British Standard Specification for Sampling and Analysis of Coke B.S.S., No. 496, 1933).

PATENTS AND TRADE MARKS.

The introduction of a new Patents and Designs Act in November, 1932, is sufficient reason for the re-issue of their brochure on Patents and Trade Marks by King's Patent Agency, of 146A, Queen Victoria Street, E.C. 4.

This booklet—the 19th edition—which is the outcome of 47 years' active experience, follows much on the same lines as those of earlier issues, dealing with matters which are of vital importance in industry and commerce and accordingly appeals to a wide number of readers. In short, the booklet outlines the present law in this country and shows the importance of enlisting expert aid in the protection of industrial property by patents, trade marks, and designs. The ever-increasing part played by patents and other forms of protection for industrial property makes it most necessary for engineers, manufacturers, and others engaged in industry and commerce to have some knowledge of these subjects.

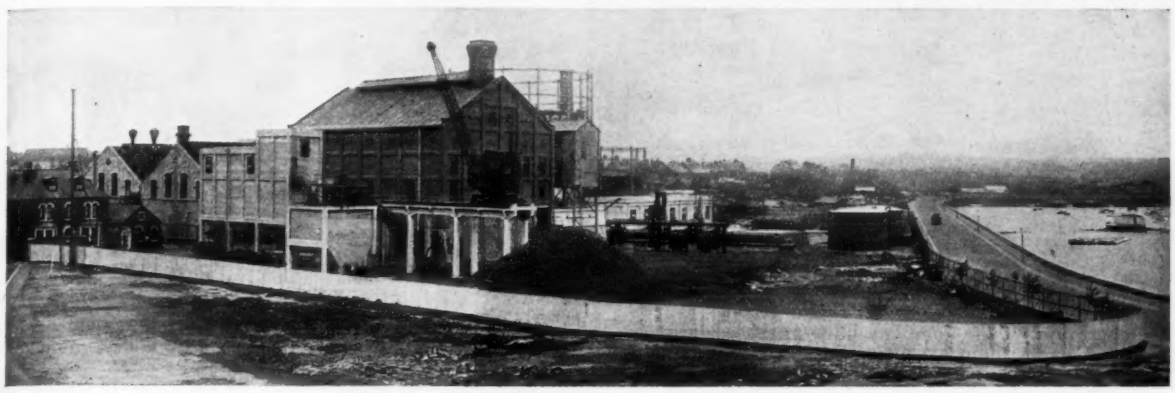
The compiler of the booklet, Mr. B. J. King, C.I.M.E., Managing Director of King's Patent Agency, has had a difficult task in condensing and explaining such purely technical and legal subjects with simplicity in so few pages; and, while space has not permitted of his treating special items such as Licences of Right, "Passing-off," concurrent uses of trade marks, and so forth, he has admirably succeeded in packing a wealth of useful information in the pages at his disposal, which are supported by excellent illustrations of specimens of work undertaken by the firm.

King's Patent Agency is in a position to place the would-be patentee or trade mark owner in possession of really useful information, and any person having an original and useful idea or invention, or desiring assistance in connection with the protection of inventions or the registration of trade marks and designs, may consult the firm free of all charge, with the full assurance that the matter will be treated confidentially and the best advice given. A copy of the present booklet will be forwarded, post free, upon application to the firm.

WEYMOUTH GAS-WORKS EXTENSIONS

A Big Scheme on Reclaimed Land

The successful completion of an important scheme of extensions carried out on reclaimed land was suitably celebrated by the Weymouth Consumers Gas Company last Wednesday, when Sir Francis W. Goodenough, C.B.E., formally opened the new works, in the presence of the Mayor and Corporation (who wore their robes of office), and a large number of guests.



THE NEW WORKS AND ROAD AS COMPLETED.

The Mayor of Weymouth (Eng.-Capt. F. W. Hamblin, R.N.Ret.), with members of the Corporation and officials, attended the opening ceremony in state, and walked through the works in procession, with Sir Francis Goodenough at the head.

When the party had assembled at the door of the power house, the Chairman of the Company (Mr. M. C. Frowde, J.P.) expressed his pleasure at the attendance of the Mayor and Corporation and so large a number of visitors, to whom he extended a warm welcome. This, he said, was one of the most important occasions in the history of the Company, for they had gathered to take part in the formal opening of works which had been rendered necessary owing to the growth of the Company's business and the extension of the town boundaries. The Directors of the Company foresaw some years ago that the boundaries were bound to extend, and in consequence they entered into negotiation with the Town Council and purchased the mudflats which were then in front of the works. To open these works they were singularly fortunate in having Sir Francis Goodenough, who was one of the most prominent figures of the Gas Industry. The extension had been called for owing to the improved facilities which they were giving to the public. Gas was first introduced to Weymouth 98 years ago, and was then sold at £1 per 1000 c.ft. To-day they were selling it at about 3s. 7d., and it was hoped that, with the economies they would make owing to the new plant, they would be able to sell it at a substantially lower price, and thus further benefit the consumers. It was a great pleasure to see present the Chairman and many of the members of the Weymouth Electricity Committee and the Borough Electrical Engineer. He hoped that the friendly relationship that had existed between the Gas Company and the Electricity Committee in the past would continue for many years to come.

The Chairman then handed to Sir Francis a gold key, suitably inscribed, and asked him to open the power house door.

Sir FRANCIS GOODENOUGH said he regarded it as an honour to be entrusted with the pleasant duty of opening these works, and he congratulated the Company upon their enterprise. He wished them all prosperity in the future in their great service to the town, and had much pleasure in declaring the extensions open.

The MAYOR proposed a hearty vote of thanks to Sir Francis for performing the ceremony, and to Sir Russell Bencraft and Sir Alexander Pengilly for attending.

An inspection of the new plant, under the guidance of the Engineer and Manager (Mr. John T. Joyce), who had been responsible for the design and carrying out of the scheme, was followed by the presentation to the Mayor and Sir Francis of a number of men each of whom had served more than forty years with the Company.

EARLY HISTORY.

Gas has been supplied to the Borough of Weymouth and Melcombe Regis for 98 years.

The original gas-works were erected by Mr. William Wharton Burdon, a colliery proprietor, who was one of the Members of Parliament for the Borough. He remained the sole proprietor of the works until 1866, although in the year 1856 an Act of Parliament was obtained to form a Company to be called "The Weymouth and Melcombe Regis Gas Company" with an authorized capital of £20,000. Gas was supplied at £1 per 1000 c.ft.

In the year 1866, a limited liability company was formed under the title of the Weymouth Gas Consumers Company, Ltd., and in the following year the present Company was incorporated and obtained statutory powers for conducting its business by the Weymouth Consumers Gas Act. The capital of the Company then authorized was £30,000, divided into 3000 shares of £10 each, with powers to borrow on mortgage £7500. Further powers were obtained increasing the capital in 1875 and 1897.

Sir Francis Goodenough is thanked by the Mayor.

Retort Settings (Charging Side) Showing Congdon Pipes.

The operations of the Company have increased in magnitude every year without exception, and in 1928 three acres of mud flats were purchased from Weymouth Corporation and reclaimed.

In 1929, a Board of Trade Order was granted enabling the Company to extend its limits of supply and to make and store gas on the newly acquired land. A gasholder was then erected at Broadwey, and a supply of gas extended to the parishes of Upwey and Broadwey. A further Board of Trade Order was obtained in 1932 adopting the basic price principle.

The authorized capital of the Company is now £129,000 ordinary or preference stock, with borrowing powers amounting to £68,400.

The remarkable progress of the Company in the last twenty years is shown by the following figures:

Gas distributed, 1932	256,409,000	c.ft.
,, ,, 1912	136,583,500	,,
Increase	119,825,500	c.ft.
Number of consumers, 1932	7336	
,, ,, ,, 1912	4362	
Increase	2974	

THE NEW WORKS.

The new works are constructed on land reclaimed by the Gas Company. Before reclamation, the site was mudlands at low tide, while at high tide it was covered by tidal water over 8 ft. deep. More than 90,000 tons of filling was used to build the reclaimed land to the requisite level, and owing to the scarcity of filling in the district, the bulk of the material had to be conveyed twelve miles.

The foundations generally involved the manufacture and driving of 380 pre-cast reinforced concrete piles 14 in. and 12 in. square of varying lengths up to 35 ft., requiring some 65 tons of British steel and approximately 500 cub. yards of concrete. Solid reinforced concrete rafts on piled foundations for carrying the retort bench, purifiers, tar and oil tanks, condenser and washing plant, and strongly braced beams, &c., on piled foundations for supporting the retort house, coal store walls, coke bunkers, crane gantry, water tanks, and power house account for another 2100 cub.yds. of concrete with 150 tons of steel.

The brick-panelled retort house is built of Wellington red bricks. The suspended stage floor is 6 in. thick finished off with "Nori" paving bricks and is supported on strong beams and 12 in. square columns about 12 ft. high. An interesting feature is the hydraulic conveyor, constructed of reinforced concrete and carried on the stage floor beams and trestles 12 ft. high. The trough is 80 ft. long, including a curved portion, and varies in depth from 1 ft. 3 in. to 2 ft. 6 in. It is reinforced principally with expanded metal, and as will be readily understood, called for great accuracy in construction.

The coal store is formed by three reinforced concrete walls 18 ft. high adjacent to the retort house, and has a capacity of 1000 tons.

Close to the retort house is a 60-ton capacity hopper for receiving the coke from the house. It is supported by columns 20 ft. high on piles 30 ft. long, and its internal sloping sides are lined with blue bricks.

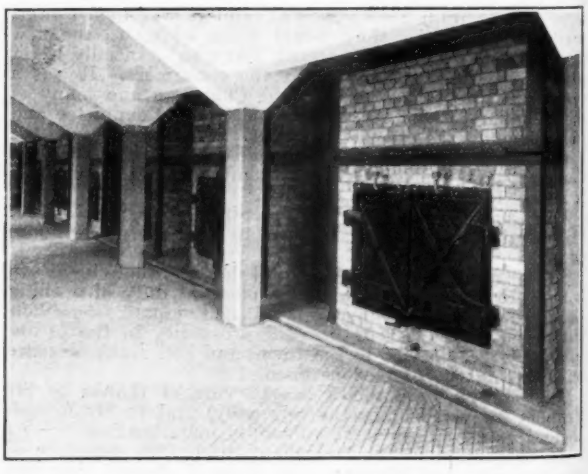
The coke storage bunkers have a capacity of 130 tons of screened coke of varying sizes. The concrete side walls are extended and roofed over to form a housing for the coke screens over the bunkers, and embodied in the roof at one end is a concrete receiving hopper for feeding the screens. The coal bunkers are divided into compartments for various sizes of graded coke by concrete partitions, and the internal sloping sides are lined with blue bricks.

The power house is a flat-roofed building of pleasing design. It is partitioned into three rooms; one for housing the electric generating plant; one for the boosters, governors, and meter; and the third for the laboratory. A water cooling tank is built on the roof over the generating plant, but this is masked by a parapet around the house roof.

The whole of the reinforced concrete construction, together with the making and the driving of the piles for the foundations, has been undertaken by Messrs. Thos. Vale & Sons, Ltd., of Stourport.

Carbonizing Plant.

The new installation of coal carbonizing plant incorporates all the most recent improvements in gas engineering practice. The whole of the work has been carried out to



The Producers.

During the Inspection.

The Mayor is seen with Mr. P. G. G. Moon, of Bournemouth, on his right hand.

the design, drawings, and specification prepared by the Company's Engineer and Manager, Mr. J. T. Joyce, and comprises horizontal retort house and retort bench unit capable of producing one million c.ft. of 500 B.Th.U. straight coal gas from unscreened Wearmouth coal, complete with stage floors, Congdon mountings, F.A. charging machine, coal and coke handling plants, &c.

The retort bench comprises six main arches and six settings of eight horizontal retorts all served by a central spent gas flue and main uptake chimney. Arrangements have been made in the design of the main flue and chimney for the future installation of a waste-heat recovery system.

Each main arch is filled in with the latest type of high-efficiency regenerator setting of eight horizontal retorts 23 in. by 16 in. large capacity section by 23 ft. overall length in four tiers. The regenerators are constructed on the Gibbons deep regenerative system and provided with graduated firing control for heating the retorts. Each regenerator comprises four separate sections for conducting the spent gas and secondary air streams, and is capable of utilizing all the sensible heat abstracted from the producer fuel. The graduated firing action of the regenerators is controlled at eight points per setting by adjustable screw slides regulating the flow of secondary air. Compensated draught regulation is provided to each setting by four dampers directly controlling the spent gases from the regenerative sections to the main outlet flue and chimney.

The retort settings are fired from self-contained producers fitted with the improved type of cascade step-grate furnaces, complete with massive charging feeders and doors.

The combustion chambers and division walls between the retorts are built in solid silica brickwork. All retorts are made from siliceous moulded material set in three lengths having plain ends with cast-iron sleeves. The retorts are substantially protected by silica shields and tiles over the whole length of the setting. Provision is made in the front walls of the completed settings for special insulation brickwork to minimize heat losses from external radiation.

The stage floors are carried out in reinforced concrete with provision for steel chequered fender plates around the bench.

The retort bench mountings include a complete installation of Congdon scrubber standpipes to suit the six new settings of eight retorts on the charging side. The standpipes are designed for receiving the gas from four tiers of retorts and are connected with an overhead longitudinal collecting main fitted with hot liquor spraying apparatus. The foul main is fitted with a special type of " Arca " regulator governor and " Arkon " gauge for recording pressure and vacuum conditions, together with the necessary connection to the existing condensers.

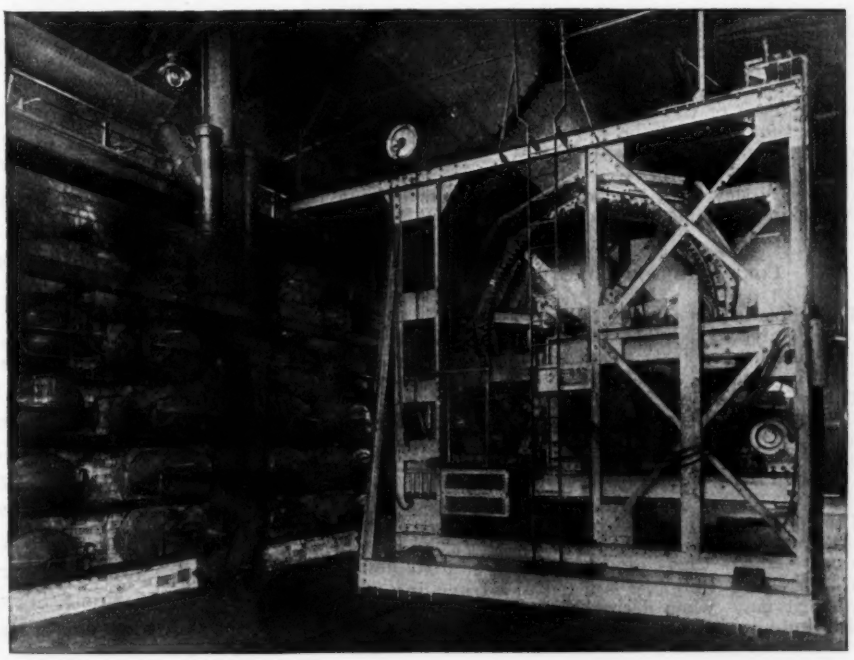
Coke and Handling Plant.

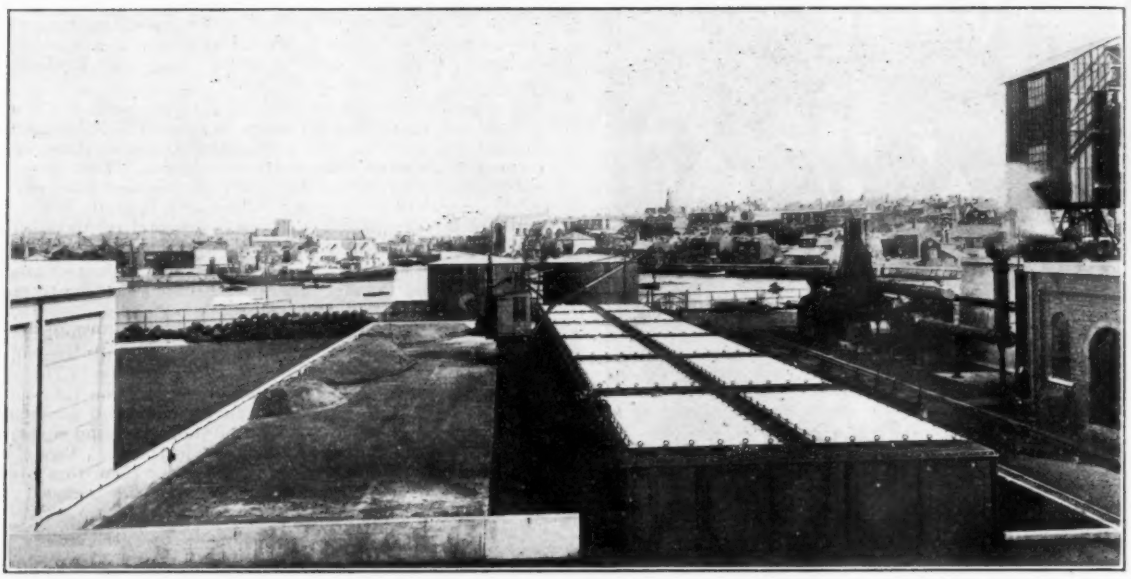
The coal handling plant serving the new retort bench has a capacity of 25 tons per hour and includes external crushing machinery and inclined elevator arranged for feeding an overhead conveyor and six bays of continuous storage bunkers with sufficient capacity for 48 hours' working. Coal is mechanically handled to the crushing pit by an overhead monorail telpher system having quick action grabs for discharging the coal. The various sections of the plant are driven by electric motors.

The new retort bench is served by a Le Fleuve draining conveyor designed for receiving the coke discharged from the six settings of eight retorts and conveyed by water to external reinforced concrete storage bunkers. The flume trough is 30 in. wide and constructed of reinforced concrete extending for the entire length of the retort house and continuing in a curve to the drainage conveyor. The drainage conveyor is made up with continuous steel tray plates carried by double mild-steel chains driven by an electric motor. This conveyor is arranged at an angle of approximately 30° and provided with steel chutes for receiving and discharging the quenched coke.

The water pumping machinery includes two latest type centrifugal Rateau pumping plants, complete with suction and delivery connections from storage tanks to flume system. In connection with this work, reinforced concrete tanks are arranged alongside the retort house side wall for reclaiming the water and breeze from the system.

The Fidde-Aldridge Charging Machine.





COAL GAS PURIFIERS AND OXIDE HANDLING PLANT.

In addition to this plant there is also an elevated gantry and 2½-ton travelling steam crane for handling the coke by means of a 1-ton automatic skip from the draining conveyor discharging bunker to an overhead Zimmer screening plant and range of reinforced concrete coke bunkers situated in the works yard.

The charging machine was made and supplied by Messrs. Aldridge & Ranken, Ltd., of Bath and London, and is of their latest design, incorporating many recent improvements. It is simultaneous in its action—*i.e.*, the coke is discharged by the same stroke that takes in the coal. It has two motors, one operating the charging and hoisting motions, and the other the travelling of the machine along the retort house.

The charging unit is of the maker's latest type of open-sided chain, working in conjunction with a sliding trough; heavy and level, while lightly laid, charges being assured without spillage.

The machine takes its supply of coal automatically from the continuous overhead bunkers by means of the Aldridge & Gibson automatic doors; special striking pins (which can be lowered out of action at will) being provided on the receiving hopper of the machine to engage with the door levers.

The whole of the electrical work was installed by Messrs. Aldridge & Ranken, Ltd. The generating plant consists of duplicate sets of 75-h.p. " National " gas engines coupled to 54 kw. dynamos made by the Electric Construction Construction Company. Each of these generating sets will take care of the normal load, but arrangements are so made that they may be run in parallel if required. The current generated is 220 volts D.C.

The stationary motors were made by Messrs. Mawdsleys, Ltd., of Dursley, and the crane type motors driving the F.A. stoking machine and the telpher are of B.T.H. manufacture.

Coke Breaking and Screening Plant.

The whole of the coke breaking and screening plant was made and erected by Messrs. Aldridge & Ranken, Ltd. The coke is discharged from the receiving hopper by means of a reciprocating trough, which ensures a steady outflow.

This trough delivers the run-of-retort coke to a " Nelson " breaker, which can be adjusted so as to give the required product. From the bottom of the " Nelson " breaker the broken coke passes down a chute to the screens, which are of the improved Zimmer type, reciprocating at approximately 350 strokes per minute.

The screens are in two sections, each about 21 ft. long, and the coke is thus screened and distributed to the several compartments of the reinforced concrete storage hoppers.

The " Nelson " breaker is fitted to a travelling carriage, so that it may, when desired, be moved out of action, a plain chute taking its place. This improvement on the usual by-pass methods provides ample space for renewing, when it is required to do so, the breaking elements of the machine, which, owing to their special design, can be removed and replaced with facility. The rated capacity of the breaking and screening plant is 15 tons per hour, and all the moving parts are driven from one 15-h.p. motor.

The retort house framing was supplied and erected by Messrs. Willey & Co., Ltd., of Exeter, and constructed entirely of British steel.

Ancillary Plant.

Two steel tar and oil tanks have been erected, each having a capacity of 50,000 gallons. The oil tank is constructed entirely of ¼ in. steel plates. The tar tank has ⅜ in. thick bottom plates, and ⅜ in. and $\frac{5}{16}$ in. side plates. Both tanks have been suitably covered and provided with indicators, &c. These tanks were also installed by Messrs. Willey & Co., Ltd.

The Livesey washer, with a capacity of 2 million c.ft. per day, was provided by Messrs. Willey & Co., Ltd.

The two station governors are of the Simpson patent type, and were constructed and erected by Messrs. Willey & Co., Ltd.

A Holmes-Connersville meter with a nominal hourly rating of 62,000 c.ft. of gas has been installed by Messrs. W. C. Holmes & Co., Ltd., of Huddersfield.

Duplicate gas boosting fans, direct coupled to 12-h.p. electric motors and controlled by Brookhirst variable speed control panels are installed in the booster house. These boosting fans are each capable of boosting 225,000 c.ft. of gas from 8 in. to 18 in. water pressure, and were installed by Messrs. Keith & Blackman Co., Ltd., of London.

List of Contractors.

Messrs. Vale & Sons, Ltd., Stourport, Worcs.

Messrs. Gibbons Bros., Ltd., Dudley and London.

Messrs. Aldridge & Ranken, Ltd., Bath and London.

Messrs. Willey & Co., Ltd., Exeter and London.

Messrs. C. & W. Walker, Ltd., Donnington, Salop.

Messrs. W. C. Holmes & Co., Ltd., Huddersfield.

Messrs. Keith & Blackman Co., Ltd., London.

Messrs. Whessoe Engineering Company, Ltd., London.

Messrs. Geo. Waller & Son, Ltd., Stroud, Glos.

Messrs. Stothert & Pitt, Ltd., Bath.

Messrs. Morris & Sons, Ltd., Loughborough.

Messrs. Strachan & Henshaw, Ltd., Bristol.

From left to right: Sir Alexander Pengilly, Mr. M. C. Frowde, Mr. J. T. Joyce, the Mayor, and Sir Francis Goodenough.

LUNCHEON.

After the opening ceremony, a party of about 130 was entertained by the Gas Company at luncheon in the Hotel Burdon. Mr. Mark C. Frowde (the Chairman of the Board of the Directors of the Company) presided, and other Directors of the Company with him included Messrs. C. H. Bown, H. Lambert, J. R. George, and J. Vincent. Further representatives of the Company present were Messrs. J. T. Joyce (Engineer and Manager), E. Kitchen (Secretary), J. Fletcher (Clerk of the Works), W. Verity (Assistant Manager), and W. Symes (Foreman). Though the party was large, the handsome room available in the hotel for the purpose was amply sufficient, and the service in every way was fully adequate to the demands made upon it. Additional enjoyment was lent to the occasion by an excellent programme of music rendered by the Band of H.M. 2nd Bn. the Dorsetshire Regiment, under Bandmaster G. E. Hudson.

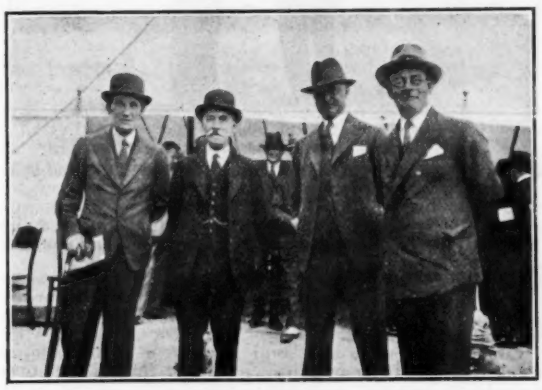
Congratulations.

Sir Russell Bencraft proposed "The Town of Weymouth," remarking that the borough to-day was five times the size it was 38 years ago. The gas-works they had just inspected were the cleanest he had ever seen. [Applause.] In Weymouth they had a progressive Corporation, and he felt confident that there was a great future both for the town and for its Gas Company.

In replying, the Mayor said that the Directors of the Company had seen fit to risk a very great deal of capital in extending their works, and this must mean that they had faith in the future of their undertaking and faith in the future of Weymouth. He congratulated their popular Chairman on the wonderful work that had been accomplished, and in doing so could not leave out the name of Mr. Joyce, who had been responsible for the designing and carrying out of these extensions in the very efficient manner in which this had been done. ["Hear, hear."]

Sir Alexander Pengilly submitted "The Gas Industry," and congratulated the Company on its progressive policy. After quoting some figures indicating the magnitude of the Industry, he went on to say that the Company had been extremely fortunate in securing the presence of Sir Francis Goodenough to perform the ceremony that morning. They were also fortunate in having the services of Mr. Joyce in connection with the important scheme that had now been brought to a successful conclusion

Sir Francis Goodenough, in the course of his response to the toast, said it had been a very great pleasure to meet the Company's long service men that morning. He himself had completed 42 years when he retired from the Gas Light and Coke Company's service, and he was very proud of this record. The steady progress of the Gas Industry throughout the country during the past twenty years, and not least during the years immediately past, had, he continued, completely upset the prophecies at one time freely made—and sometimes even now repeated by those ignorant or neglectful of the facts—that gas



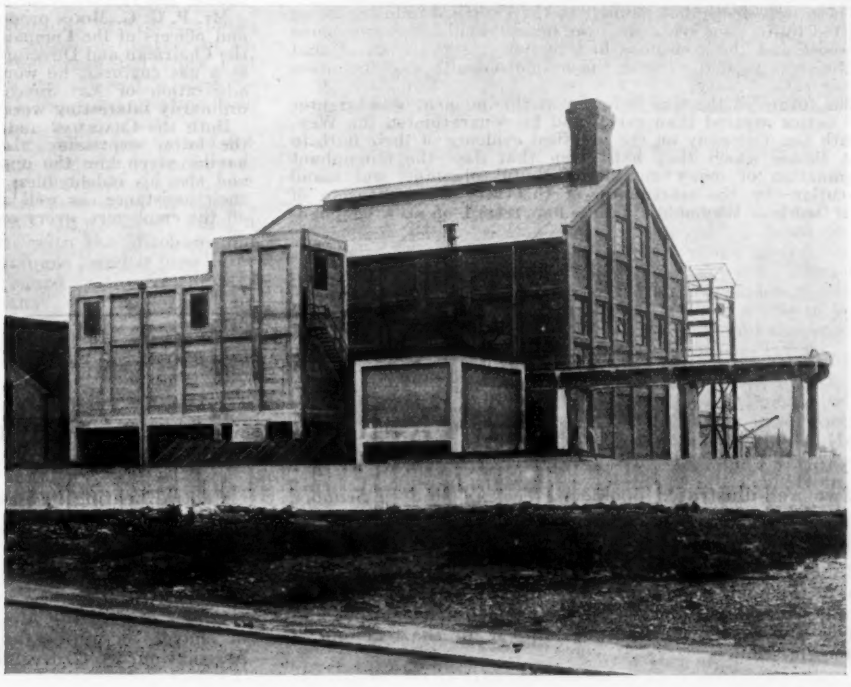
From left to right: Mr. J. C. Walker (B.C.G.A.), Mr. C. S. Bennett (Gibbons Bros.), Mr. S. G. Watson (W. C. Holmes & Co.), and Mr. T. H. Woodcock (Stroud).

was destined to be eclipsed by its younger sister in the public service, electricity.

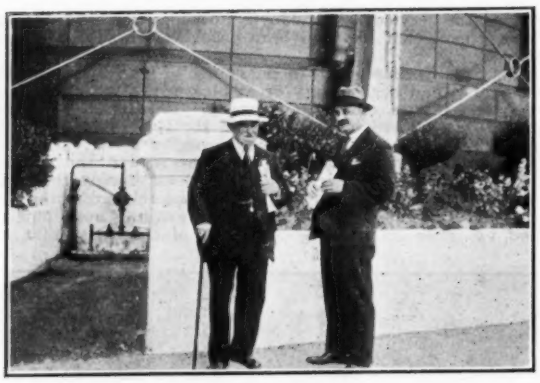
Weymouth's Progress.

During those twenty years, the output of gas in these islands increased by 50%. In Weymouth, it increased by 88%; while the number of consumers in the district grew by nearly 70%. These figures spoke eloquently, first of the progress of the town; secondly, of the forward policy of the Gas Company; and last, but not least, of the growing popularity of the commodity they supplied. For it must not be forgotten that during those twenty years the efficiency of gas apparatus steadily increased, so that for the sale to have grown more rapidly than the number of

Reinforced Concrete Hoppers and Gantry for Coke Handling and Screening.



users was clear proof of the more extended use of gas all round. This, while surprising to those who were obsessed with the idea that, because electricity was "coming," in its own sphere, gas was "going"—whereas the only sense in which gas was going was that it was "going strong"—was only what would be expected by those who know the facts. For the facts were these: Thanks to its economy and efficiency and the fact that it



Shanklin and Ryde.

Mr. F. C. Taylor, of Shanklin, and his son, Mr. F. W. Taylor, of Ryde.

warmed while it illumined, gas lighting held its own in millions of homes as well as in miles of streets and thousands of workshops.

Thanks to the very general approval and adoption of gas fires by the medical profession, of which no less than 7000 members in London alone used and recommended gas fires, that method of cleanly and labour-saving heating which combined with it the valuable and most important function of ventilation, was growing rapidly in popularity, not least in seaside towns. Thanks to its economy, reliability, and cleanliness, gas cooking had become practically universal, from the most fashionable restaurants and hotels to the smallest kitchens in the homes of the people. To all intents and purposes, the nation cooked by gas. Thanks to its reliability, adaptability, and economy—direct and indirect—gas was rapidly extending its service in the factories and workshops of the country. In short, gas was definitely establishing itself as *the fuel of the future.*

A Coal-Power Country.

That was bound to be the case in a country that had next to no water power and no oil wells, but had cheap and abundant supplies of coal; bound to be the case when it was remembered, moreover, that the gas-works sold, as gas, coke, or chemicals, close on 80% of the potential heat in every ton of coal it bought, whereas the most efficient electric generating station lost that percentage in the process of converting coal into steam, steam into electricity, and electricity back into heat after conveying it to the consumer's premises—a most wasteful series of processes.

These were facts that pointed to the electrical industry being roasted by its own grid, when the financial chickens came home to roost and the consumer had to pay the full costs of that politician's speculation with the nation's wealth and spoliation of her rural beauty.

The future of the Gas Industry at this moment was brighter and better assured than ever; and he congratulated the Weymouth Gas Company on the practical evidence of their faith in that future which they had given that day—the triumphant culmination of many months of skilful planning and sound execution—by the starting-up of this very fine extension of their works. Weymouth had a fine record of growing popularity and steady progress, from the days of the First Edward to the Seventh, and from those of the Third George (who spent many holidays with his family in the town) to those of the Fifth, whose popular son, the Prince of Wales—popular for his untiring service to the whole nation, and particularly to the underdog, as well as for his personal charm and sympathetic understanding—was honouring the town by a visit next day. [Applause.] Its Gas Company had just given one more of many proofs that, like the town it served, it was popular because it was progressive; and he was sure they would all join with him in felicitating Town and Company alike on the splendid addition to the amenities of the one that had been provided by the other.

The Contractors.

The Chairman, proposing the toast of "The Contractors," remarked that, without the admirable work these firms had performed, they would not have been celebrating that day the successful completion of the scheme. From all the engineers he had spoken to that day he had heard nothing but commendation. The reclamation work had been very difficult. They had reclaimed nearly 4 acres of land from tidal waters—a task of which Mr. Joyce, Mr. J. Fletcher (Clerk of Works), and Mr. W. Verity (Engineer's Assistant) must feel justly proud. The Board were very pleased with the whole of the work that had been carried out, and he wished on their behalf to thank Mr. Joyce and the other two gentlemen whose names he had just mentioned for all they had done.

The Engineer and Manager.

With some of the flowers found growing upon his works.

Responding, Mr. F. S. Vale, of Messrs. Vale & Sons, Ltd., paid warm tribute to Mr. Joyce and his staff for their work.

Mr. C. S. Bennett, of Messrs. Gibbons Bros., who also replied, said the Company had shown great foresight in bringing their works up-to-date, when they could do it on the very best terms. He hoped the works and plant now laid down would be the means of the Company reaping even greater prosperity in the future, and further reducing the price of gas to the community.

Mr. P. G. G. Moon proposed a vote of thanks to the Directors and officers of the Company. He said they were all grateful to the Chairman and Directors for their hospitality that day, while, as a gas engineer, he would like to say a word of praise and admiration of Mr. Joyce and his assistants for the extraordinarily interesting work they had seen that morning.

Both the Chairman and Mr. Joyce acknowledged the vote—the latter expressing his indebtedness to the Directors for having given him the opportunity of carrying out this work, and also his indebtedness to Mr. Fletcher and Mr. Verity for their assistance, as well as to the foreman of the works and all the employees, every one of whom had done his best.

Better Health in Better Schools

Two well-illustrated booklets (*Heating Modern Schools*, parts I. and II.) give a bird's-eye view of several of the newest elementary schools in the country.

In the schools described and illustrated are classrooms where the temperature is automatically controlled; cloakrooms which are specially fitted for drying wet clothes and shoes; and even a model flat equipped for the teaching of domestic science.

Central heating by gas-fired boilers has been adopted in all the new schools described. The development of panel-heating and under-floor heating is a feature which will be of interest to all school authorities and architects. It is confidently hoped that the hygienic improvements in these schools will reduce the number of absences due to illness.

Copies of *Heating Modern Schools* can be obtained free of charge on application to the British Commercial Gas Association, 28, Grosvenor Gardens, London, S.W. 1.

Croydon Company Inaugurate : : New Spiral Gasholder : :

Storage Increased by One and a Half Million C.Ft. in the Carshalton District

An interesting little ceremony was held at Carshalton on May 10, when a new 1½ million c.ft. spirally-guided gasholder was officially inaugurated for the Croydon Gas Company by the Chairman of the Carshalton Urban District Council, Mrs. K. M. Baker, J.P.

Among those present, besides Mrs. Baker and other members and officers of the Urban District Council, were Mr. William Cash, J.P., F.C.A. (Chairman of the Company), Mr. William Cash, Junr., M.A., F.C.A., Mr. Guy Savory, and Mr. Charles Hussey, J.P. (Directors), Mr. W. J. Sandeman (General Manager), Mr. W. Grogono (Engineer), Mr. F. F. Wood, F.C.I.S. (Secretary), Mr. W. A. Bishop (Sales Manager), Mr. P. Richbell (Mains Superintendent), Mr. M. O. Coates (Editor of the Company's Co-Partnership Magazine), together with other officers and co-partnership representatives of the Croydon Company, and representatives of the London County Council.

Early Days of Gas at Carshalton.

Mr. William Cash, at the outset, said it gave him great pleasure to welcome Mrs. Baker and the other members of the Council, and to thank her for coming there to perform the inauguration of their new gasholder. He also took the opportunity of welcoming representatives of the contracting firms—Messrs. Robert Dempster & Sons, Ltd., of Elland, who carried out the erection, and Messrs. H. Hemmings, Ltd., who were responsible for the foundation work. They were also indebted to their own Chief Officers for all they had done in connection with the planning of the holder. It was designed by their Engineer, Mr. Grogono, while the specifications were prepared by their Chief Draftsman, Mr. F. J. Harrisson.

Mr. Cash went on to outline the introduction of gas in the Carshalton area, and the progress of gas supply since those days. On Sept. 29, 1851, he said, an agreement was made between about 32 persons to form a company to manufacture inflammable air or gas from coals or any other materials, for the purpose of supplying light to the parishes of Carshalton and Beddington and the hamlet of Wallington. In the following year the Carshalton Gas and Coke Company was formed, with a capital of £2000. The Directors were: Mr. John Ashby, a miller, Mr. John David Clements, a surgeon, Mr. Robert Smith, a plumber, Mr. Charles Reynolds, Mr. Joseph Aris, and Mr. William Morley Stears, a gas engineer.

The Board met on the first Wednesday of every month, and every Director who attended within a quarter of an hour by the office clock after the appointed time and stayed until the end of the meeting was allowed 5s. as compensation for his trouble. In 1865 the compensation was increased to 10s.

The land on which the works were built was leased for 99 years at a yearly rental of £20, and the freehold was purchased from John Watney in November, 1864, for £650. A further piece of land was purchased in March, 1879, from J. V. Franklin for £20. In October, 1864, a proposal was made to amalgamate with the Mitcham and Wimbledon District Gas Light Company, and a year later a similar proposal was made in regard to the Sutton Gas Company. In 1894 the Company was absorbed by Croydon.

The following table showed the comparative statistics for the years 1894 and 1932 in regard to the district supplied by the old Carshalton Company:

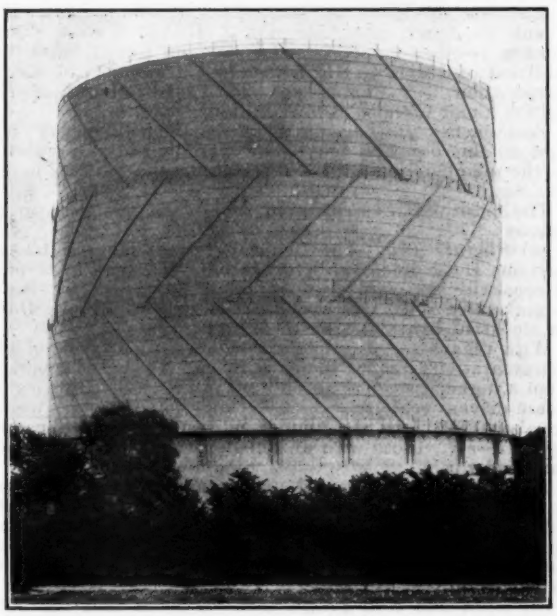
—	1894.	1932.
Price of gas per 1000 c.ft.	4s. 6d.	3s. 9d.
Quality	16 candle power	500 B.Th.U.
Number of consumers	594	17,598
Sales of gas	31,479,400 c.ft.	578,007,200 c.ft.
Miles of main	21	98

These figures, said Mr. Cash, were not strictly comparable, as, by an agreement dated Nov. 30, 1876, the parish of Beddington was supplied by both the Croydon and Carshalton Companies.

The New Holder.

Referring to the new holder, Mr. Cash said that this was a 3-lift, spiral guided, with a capacity of 1½ million c.ft. The steel tank was 140 ft. 6 in. in diameter by 37 ft. 3 in. deep; the height of the holder, exclusive of tank, was 108 ft. 9 in., and the total weight of the steelwork 880 tons. The tank held three and a half million gallons of water, the value of which was about £300.

The concrete foundations for the holder were started on May 3, 1932, and completed on July 18, 1932. Some 1500 cubic yards of concrete containing 300 tons of cement were used, the thickness being 2 ft. 6 in. The contractors commenced the erection of the holder on July 26, 1932, and the building of the tank was finished on Saturday, Nov. 12, 1932, the whole contract being completed on May 18, 1933. The holder had been painted a light grey colour at the request of the Council. Some cottages had been erected for the Company's employees adjacent to the holder.



Croydon Company's New 1½ Million Holder at Carshalton.

The old wall on Wrythe Lane, which was in a bad state of repair, said Mr. Cash, was being pulled down and a new wall erected with concrete blocks made at the works. It was proposed later on to pull down the old house, &c., facing Wrythe Lane and to erect a showroom and two or three shops. It was also proposed to plant a line of trees, probably poplars, between the works wall and the holder.

The Valve Opened.

Mrs. Baker then proceeded to the governor house adjoining the holder, where two 18-in. Peebles governors are installed for supplying gas to Carshalton and the St. Helier Estate (which latter is being built by the L.C.C.); and here she opened the valve admitting the gas from the new holder to the district.

Returning to the marquee where tea was provided at the kind invitation of the Croydon Gas Company, Mrs. Baker expressed her pleasure at being asked to perform the ceremony of opening the new holder—and, she added amid laughter, she wished people would get out of the habit of calling it a gasometer. There had been a certain amount of dismay among the inhabitants in the vicinity over this holder, and the Council had been " slated " for

allowing it to be erected. But, Mrs. Baker pointed out, the Gas Company were perfectly within their rights, and, as a statutory concern, were under an obligation to provide this service; and it would be appreciated that the Company were doing all in their power to prevent the advent of the holder proving a nuisance. There was to be no works there, for all the manufacturing side would be continued at Croydon; there would be no smell and no noise—merely the container.

Having referred to the coincidence of her own family connections with the Gas Industry, and therefore her natural interest in its welfare, Mrs. Baker congratulated the Croydon Company on their high ideals and particularly in connection with their co-partnership scheme. Her own father, she said, was a keen supporter of George Livesey when the scheme was first adopted in his Company. She was glad that the co-partnership representatives were there on that occasion. She also congratulated the Company on the facilities provided for training men and boys to become qualified gasfitters, and, in conclusion, expressed the hope that the new holder would be the means of providing a yet more adequate gas service in the Carshalton district.

MODEL OF HOLDER PRESENTED TO MRS. BAKER.

Mr. CASH thanked Mrs. Baker very heartily on behalf of the Directors for her kindness in performing the inauguration of their new holder and for her remarks. As a memento of the occasion, he asked her to accept a silver model of the holder.

At the conclusion of tea, Mrs. BAKER thanked the Croydon Company for their hospitality on behalf of her Council, and a number of those present took the opportunity of ascending the holder.

National Gas Council

Meeting of Central Executive Board

A meeting of the Central Executive Board of the National Gas Council was held on Tuesday, July 11, the chair being taken by Mr. WILLIAM CASH, J.P., F.C.A. (Vice-Chairman), pending the election of a Chairman.

Election of Chairman.—Sir David Milne-Watson was unanimously re-elected Chairman of the Board for the ensuing year.

Election of Vice-Chairmen.—Mr. William Cash, Mr. Frank H. Jones, and Alderman J. H. Lloyd were unanimously re-elected Vice-Chairmen of the Board, with the addition of Major G. H. Kitson (Chairman of the Leeds Corporation Gas Committee and Past-President of the British Commercial Gas Association).

Parliamentary.—The agenda was such a heavy one that on this occasion a written report had been circulated to the members of the Board, covering the matters under this head.

The position, it was stated, might be summed up as follows:

(*a*) *Finance Bill.*—The Chancellor had adhered to the Customs Duty on heavy hydrocarbon oils, save in respect of coastwise shipping. Unfortunately, however, he refused to make any concession in connection with the Excise Duty on stocks of heavy petroleum oils.

With regard to gas-propelled vehicles, as a result of the representations made these vehicles had been removed from a higher category and placed in the same category as steam-driven vehicles, which meant that the tax would be about £25 less per annum in respect of the heavier vehicles—*e.g.*, those with an unladen weight of 5 or 6 tons and upwards.

The Council had pressed an amendment for excluding the weight of gas cylinders in the computation of the unladen weight of gas-propelled vehicles. Although this had received a very considerable volume of support in the House, the Minister of Transport had refused to make any concession in this regard.

(*b*) *Road and Rail Traffic Bill.*—A claim that the Conjoint Conference of Public Utility Associations should be represented on the Transport Advisory Council had not yet been decided by the Committee.

(*c*) *Gas Light and Coke Company's Bill.*—This Bill was passed by the House of Lords with one unimportant amendment. In the case of the *Electricity Supply Bill* and the *Essex County Council Bill*, the Council had been successful in obtaining many amendments of considerable value.

(*d*) *Housing Act—Slum Clearance and the Case of the Great Yarmouth Gas Company.*—It was reported that formal objections had been made by the Council's Parliamentary Agents (Messrs. Dyson, Bell, & Co.), and a local inquiry was being held at Great Yarmouth on July 12, which Mr. Browne, of Messrs. Dyson, Bell, & Co., would attend on behalf of the Great Yarmouth Gas Company and the Great Yarmouth Water Company, for the purpose of emphasizing the necessity of a fair measure of compensation being awarded to the Companies.

Mr. Browne would also appear on behalf of the Great Yarmouth Gas Company and the Gorleston and Southtown Gas Company for the purpose of ensuring that these two Companies had the same facilities for supplying the new premises and the tenants thereof with gas as the Electricity Department of the Corporation would enjoy with electricity.

Control of Trading Departments by Borough Treasurers.—It was reported that a Committee had been set up by the Conjoint Conference of Public Utility Associations to investigate the question of the increasing tendency for Borough Treasurers to assume control over trading departments of Local Authorities, and to take such action as might be necessary to protect the interests of such departments.

The Conjoint Conference had further agreed that each of the interests—viz., gas, water, and electricity—should appoint three representatives of municipal undertakings to form the Committee. Three representatives were appointed by the Board to represent the Gas Industry on the Committee.

Gas for Industrial and Commercial Purposes.—It was reported that a further meeting of the Joint Co-ordinating Committee had been held on May 25 for the purpose of expediting as far as possible the formation of District Centres in those regions where this had not already been done, and, secondly, to set up a Technical Liaison Committee so as to give effect to the policy laid down by the National Conference held in London on Feb. 7 last.

At this meeting a report had been received from all the districts, from which it appeared that satisfactory progress was being made. A "Yorkshire Centre," consisting of the Leeds and Sheffield Undertakings, had been definitely established, and it had been agreed that Bristol should act as the Centre for the South-Western District. Scotland and the Manchester Districts were completing an organization for the establishment of a Centre, and in the last-named district the Liverpool Gas Company had offered to form a Centre for West Lancashire and Merseyside. The Centres for the Southern and Eastern Districts would be located in London.

It was satisfactory to report that the District Centres were getting to work, and that there had been numerous cases in which practical assistance and considerable service to undertakings had already been rendered.

Mains and Cables in Highways.—*It* was reported that a further meeting had been held on June 20 of the gas and electricity interests and the representatives of the Associations of Highway Authorities, when the revise of a clause drafted by Counsel was considered. This revise contained new provisions, the nature of which had been discussed at the previous meeting. It was stated that there would be a further meeting of the Joint Negotiating Committee in the first week of August.

Central Gas Advisory Board.—The Board approved the Constitution of the Central Gas Advisory Board, as circulated.

International Gas Conference and 15th Annual Convention of the American Gas Association.—A letter dated May 10 from the American Gas Association was considered, inviting members of the Council to attend the above Conference. Arrangements were accordingly made for the Council to be represented on this occasion.

Royal Sanitary Institute—44th Congress held at Blackpool in June.—It was stated that the Council's representative, Mr. A. L. Jennings, had forwarded a report of his visit to the Congress on June 23, when the Section considered architecture, town planning, and engineering. The Board expressed their thanks to Mr. Jennings for his report.

National Smoke Abatement Society—5th Annual Conference to be held at Sheffield on Sept. 22, 23, and 24.—Mr. R. Halkett was nominated to represent the Council at this Conference, and the Yorkshire District Executive Board will also be asked to appoint two representatives.

The Board adjourned until Tuesday, Sept. 12.

ANOTHER RADIATION ENTERPRISE

Sir David Milne-Watson Opens New Research Kitchen at Radiation House

It is now a number of years since Radiation Ltd. decided upon the innovation of having a Department devoted solely to what may be termed the purely " service " side of cooking in the " New World " " Regulo "-controlled gas cooker. The existing Kitchen at Radiation House was utilized and was equipped for the accommodation of a Domestic Research Section, the work of which was concentrated on

(*a*) The study of the possibilities of widening the scope of cooking under " Regulo " control in view of the enhanced possibilities opened up by the revolutionary design of the " New World " oven.

(*b*) The testing of recipes both old and new which, as mentioned later, are now given in many of the National newspapers and periodicals.

(*c*) The provision of facilities for carrying out tests and demonstrations to professional chefs and cookery experts.

There also arose the necessity for making known to the Press, and particularly to the Editors of Women's Pages, the various developments noted from time to time, and for dealing promptly and adequately with queries and suggestions both from them and from the general public.

Many demonstrations of such outstanding interest as to attract a large press audience were held at the Kitchen, perhaps the most noticeable being the cooking entirely without attention in a " Regulo "-controlled " New World " Cooker of a complete six-course dinner, the items of which were supplied on invitation by the chefs of the leading London hotels. All the dishes were inserted together and to emphasize the " automatic " character of cooking under " Regulo "-control, the oven was chained and padlocked during the process, the key being entrusted to one of the chefs. The senior member of the Radiation Demonstration Staff had charge of the cooking, which was timed to the second, and the result was so perfect that it evoked spontaneous expressions of pleasure from the assembled chefs.

Some time ago, however, it became apparent that a thoroughly up-to-date kitchen equipped with the latest and best appliances was necessary to meet requirements which were growing every day more varied and important. The position was made more urgent by the fact that the large National newspapers had commenced to append to their cooking recipes in the Women's Page the " Regulo " settings and cooking times; and as these recipes are often contributed from outside sources, it was necessary to make arrangements for their being properly tested—in most cases with hardly any margin of time. These circumstances reinforced the decision to undertake the laying-out and fitting of a Research Kitchen adequate to deal with the growing significance that this side of the Radiation work had assumed.

The new Kitchen represents in all respects the most modern ideas of construction and fitting. The lighting is a most effective daylight type giving a soft, clear light closely resembling diffused sunlight. The colour scheme of tiles and flooring is very pleasing, and all the bright fittings in the Kitchen are chromium-plated throughout. In addition to a complete equipment for culinary demonstrating and testing of recipes, there is also a representative selection of porcelain enamelled " New World " " Regulo "-controlled cookers and ranges.

In providing the necessary hot water supply opportunity was taken to fit " Regulo "-controlled appliances of the latest pattern, showing how different requirements, such as hot water supply for sink, lavatory basin, or for the bath, can be met efficiently and cheaply by gas.

To complete the scheme of equipment a gas-operated refrigerator and a labour-saving kitchen cabinet are installed.

Last Thursday Sir David Milne-Watson, LL.D., D.L.,

Governor of the Gas Light and Coke Company, declared the new Research Kitchen open.

THE OPENING CEREMONY.

Mr. H. J. YATES, Chairman of Radiation Ltd., expressed his gratitude and pleasure that Sir David Milne-Watson had consented to inaugurate their latest enterprise, and mentioned that it was in October of 1925 that Sir David honoured them by opening their Research Laboratories at Radiation House. It was indicative of the spirit of co-operation which existed between both sides of the Industry. There was, continued Mr. Yates, a great future for gas, particularly for cooking, heating, and hot water; but success in any or all of these fields depended on appliances which ensured complete combustion. Complete combustion was an absolutely vital factor to the Industry's prosperity. In regard to heating, the physiological conditions of the air of a room should be taken into consideration; and in this direction he had devoted many years of study and research. He had, in fact, opened laboratories in Birmingham in 1909 to investigate this problem, and events thoroughly justified this enterprise. Their latest step—the new Research Kitchen—showed that Radiation Ltd. were determined to continue research for the benefit of the Industry.

Sir DAVID MILNE-WATSON said how pleased he was to perform the opening ceremony. The Radiation Research Laboratories, inaugurated in 1925, had turned out many interesting results; and the new Kitchen provided another example of the enterprise of the firm. The idea was to show how a healthy, comfortable kitchen could be fitted up in most unlikely circumstances, and the result was a bright, cheerful kitchen, thoroughly well ventilated. It was an attempt to solve the problem of the West-End crowded area populated by a rather rich clientele; and he was sure that anything done to improve the conditions of the kitchens in this country was valuable work. If they wanted to avoid a C3 nation, they must pay heed to cooking; and in his opinion there was an alarming ignorance in England of what good cooking meant. To-day there was too great a consumption of tinned foodstuffs, which was not so nutritious as fresh foodstuffs.

The Gas Industry, continued Sir David, had a bright future, but they would not succeed against competition—keener than ever before—unless they gave efficient service, installed first-class apparatus, and then looked after this apparatus. Difficulties had to be faced, and one of the greatest obstacles to progress was the flueless room. In this connection public opinion should be roused, and the Ministry of Health should turn their attention to the evil of providing rooms without flues.

Sir David concluded by wishing all success to the Radiation Research Kitchen.

IN CONTINENTAL COUNTRIES - - -

Abstract Translations from the Technical Press of France and Germany.

RECOVERING BENZOLE WITH ACTIVATED CHARCOAL.

A. Engelhardt and H. Rüping, in *Das Gas- und Wasserfach*, 1933, 76, 478-484 (June 17), give a comparison of the wash oil and activated charcoal processes of benzole recovery with special reference to the purity of the final town gas. Small quantities of impurities have, as is well known, serious effects in promoting corrosion in the distribution system. The comparison shows that the activated charcoal process gives a particularly pure gas.

Tests were carried out in parallel on the two processes at Frankuft a.M. The gas was purified after benzole extraction in the case of the wash oil process and, of necessity, before benzole recovery in the case of the charcoal process. The results are shown in the following table:

—	Untreated Gas	Wash Oil Process.		Charcoal Process.	
		Outlet Scrubber	Outlet Purifier.	Outlet Purifier.	Outlet Adsorber
Benzole content, grammes/c.ft.	1·06	0·374	0·377	1·07	0·003
Sulphur as sulphuretted hydrogen, grains/100 c.ft.	252·1	231·6	0·09	0·04	*Nil*
Organic sulphur, grains/100 c.ft.	17·5	12·7	12·6	17·5	7·8
Total sulphur, grains/100 c.ft.	269·6	244·3	12·69	17·54	7·8
Hydrocyanic acid, grains/100 c.ft.	42·2	28·0	8·8	9·2	4·7
Naphthalene, grains/100 c.ft.	20·2	1·75	1·79	1·90	*Nil*

It is to be noted that the efficiency of benzole recovery in the wash oil process was only about 65% in comparison with nearly 100% in the charcoal process. This was due mainly to the high atmospheric temperature (approximately 79° F.) which reacted very unfavourably on a closely designed wash oil plant though without effect on a charcoal plant.

The sulphuretted hydrogen content of the gas was lowered by approximately 8% in the wash oil scrubber. The charcoal scrubber eliminated completely the small concentration of sulphuretted hydrogen which reached it. The charcoal process lowers the organic sulphur content of the gas to a much greater extent than does the wash oil process. Actually, nearly all the carbon disulphide and thiophene were removed, the residual organic sulphur being mainly carbon oxysulphide and mercaptans. This almost complete elimination of carbon disulphide in the charcoal process is of importance in view of the recently established fact that, in the distribution system, sulphuretted hydrogen (a source of corrosion and formation of deposits) may be formed from carbon disulphide in presence of ammonia.

Hydrocyanic acid, another cause of corrosion, is, of course, mainly removed in the oxide boxes. Nevertheless, in the case of the charcoal process, the outgoing gas contained only 11% of the original hydrocyanic acid content, whereas the corresponding figure in the wash oil process was 21%, or nearly twice as much.

Of the naphthalene, the wash oil process eliminated 91%, the charcoal process 100%.

A particular advantage of complete benzole extraction, as realized in the charcoal process, is that the town gas is free from condensable organic vapour, and hence cannot extract the dressing oil from the leathers of dry meters.

The contrary is the case when the gas contains hydrocarbons of high boiling point as it always does when the wash oil process is employed. Gas completely stripped of benzole does not embrittle meter leathers as was formerly supposed. Embrittlement occurs only if the gas is not adequately purified or if re-formation of sulphuretted hydrogen occurs in the distribution system,

Results in general confirmation of those tabulated above were also obtained by the authors in a test carried out on the large activated charcoal plant at Beckton, of which illustrations and a brief description are given.

The charcoal process yields a gas quite free from ammonia, ammonium cyanide being eliminated in the condensate obtained when the charcoal is steamed for removal of the adsorbed benzole. This is another useful feature, especially when the gas is to be dehydrated by means of calcium chloride, since, in presence of ammonia and the carbon dioxide contained in the gas, encrustations of calcium carbonate are formed on the brushes of the scrubbers.

The fact that the charcoal process is an intermittent one is of advantage during periods of reduced gas make, since the adsorbers need to be steamed out only when they have become fully saturated. Adjustments in a wash oil plant are not so easy.

As regards differences in the nature of the benzole recovered by the two processes, it may be mentioned that the content of corrosive sulphur is *nil* in benzole from the charcoal process in comparison with 6-10 mgm./litre in benzole from the wash oil process. The former process, moreover, yields a product with a very low content of phenols in comparison with the latter process, and the content of pyridine bases is also lower. The inhibitor process is, therefore, applicable with much greater simplicity. An oxidation test on the stabilized product shows much smaller gum formation in the charcoal product than in the wash oil product.

In view of the high adsorptive capacity of charcoal for naphthalene, it is possible to remove naphthalene from gas by means of charcoal and, at the same time, leave the bulk of the benzole in the gas. This process of naphthalene extraction becomes self-supporting if a small quantity of the benzole is also extracted.

The Society of Chemical Industry

The Fifty-Second Annual General Meeting of the Society of Chemical Industry was held in Newcastle-on-Tyne from July 10 to 13 under the Presidency of Dr. R. H. Pickard, F.R.S.

Although the matters of direct interest to the Gas Industry were few, the relationship of the Society to the Industry in various directions warrants some reference to the meeting as a whole. The outstanding feature was the Group meetings, and for the first time no fewer than three Groups of the Society held special meetings as an integral part of the whole—viz., the Chemical Engineering Group, the Plastics Group, and the Food Group. The first discussed a problem which has been worrying the electrical industry since the erection of large power stations in connection with the Grid scheme was started—namely, the elimination of poisonous fumes and grit from the emissions from the power station chimneys into the atmosphere.

There was a slight decline in membership during the past year—from 4410 on July 31, 1932, to 4333 at the time of the Newcastle meeting. A large proportion of those whose names have disappeared from the register, however, are from countries overseas where the financial depression probably arrived later than it did in Great Britain. However, the stream of new members now being elected is steadily increasing.

As usual, the President retired at the close of the business meeting—which was held on Tuesday, July 11—and Dr. Pickard is to be succeeded by Dr. J. T. Dunn, of Newcastle—a former Vice-President of the Society and late Chairman of the Newcastle Section. As was stated in the Council's report, Dr. Dunn's election happily came while the Society was holding its meeting in his native City and conveys some recognition of his 52 years' work for the Society which owes its foundation very largely to his efforts.

The Annual Meeting next year will be held in South Wales with Cardiff as headquarters, a cordial invitation to that City having been gratefully accepted.

The new Vice-Presidents are: Dr. R. H. Pickard, F.R.S. (retiring President), Dr. J. B. Firth, Mr. F. A. Greene, and Mr. Edwin Thompson. The new members of Council are: Col. E. Briggs, Dr. T. Callan, Mr. J. M. Leonard, and Mr. A. A. King. The Hon. Treasurer, Dr. R. T. Colgate, was re-elected.

Among those present at the Annual Dinner which was held on Wednesday, July 12, was Mr. F. P. Tarratt (President of the Institution of Gas Engineers).

Presentation of Society's Medal.

On Wednesday morning, July 12, in the King's Hall at Armstrong College, the Society's Medal—which has been awarded at two-yearly intervals since 1896 to chemists of exceptional distinction, as selected by the Council—was presented to Prof. W. A. Bone, D.Sc., Ph.D., F.R.S. (Head of the Department of Chemical Technology at the Imperial College of Science and Technology). The presentation was made by Dr. Pickard, the retiring President.

Following the presentation, Prof. Bone delivered an address entitled "Forty Years of Combustion Research."

The President, introducing Prof. Bone, gave some facts concerning his long life devoted to fuel problems, from the time when he entered Owens College, Manchester, with the intention of undergoing a University training in chemistry and physics, which would prepare him to occupy a position in the iron and steel industry. A factor which had greatly influenced him in his choice of course was his uncle, Mr. T. C. Hutchinson, a well-known Cleveland Ironmaster, and the Managing Director of the Skinningrove Ironworks; it was Prof. Bone's very close association with his uncle's enterprises which had eventually caused him to make a special study of the subject of fuel technology.

In 1906, when Leeds University decided to form a Department of Fuel Technology, Prof. Bone was invited to organize the Department (which was later endowed by the Gas Industry in memory of Sir George Livesey). Between 1904 and 1908, Prof. Bone, in conjunction with Prof. R. V. Wheeler, made an experimental investigation of the influence of steam in a gas producer. This was the first series of experiments of this nature to be carried out on large-scale plants, and the results were published in the *Journal of the Iron and Steel Institute*. In conjunction with the late Mr. C. D. McCourt, he had carried out researches into surface combustion, extending from 1908 to 1912. As a result of the work, incandescent surface combustion was made applicable to diaphragm heaters, steam raising in boilers, and for furnace work in general. At Leeds University he began the first scientific investigation upon gas fires.

Between 1908 and 1918 he had collaborated with his uncle, Mr. T. C. Hutchinson, at the Skinningrove Ironworks, on the problem of the ideal fuel consumption in works of this kind. This involved the proper co-ordination of coke ovens, blast furnaces, steel furnaces as well as furnaces for the rolling mills in one site, and arranging for the full utilization of all the surplus gases from both the coke ovens and the blast furnaces. Uncle and nephew were able to show that with a properly co-ordinated plant, one ton of finished steel sections could be produced from Cleveland iron ore with a consumption of not more than 1·6 tons of Durham coal.

In 1912, Prof. Bone was appointed Head of the Department of Chemical Technology at the Imperial College of Science and Technology, which included fuel technology, chemical engineering, electro-technics and refractory materials, and attracted men from all over the world to its courses. It had developed a high-pressure laboratory, and cordial relationships had been established with some of the largest industrial concerns in the country.

For the last eight years he had been directing on behalf of the Federation of Iron and Steel Manufacturers a systematic investigation into blast furnace reactions. This was a development of Lowthian Bell's classical work on the subject, carried out over 60 years ago. From 1915 to 1922 he was Chairman of the British Association Fuel Economy Committee; from 1919 to 1922 Member of the Coal Conservation Committee; and from 1917 to 1920 Consultant to the Fuel Research Board.

Since 1922 he had directed and organized researches into the chemical constitution of coals, with special reference to the maturing and developing of their coking properties and benzonoid characteristics; while his work in the field of high pressure had resulted in the discovery of N_2 activation and consequent NO formation in CO-O_2-N_2 explosions at high pressures; the synthetic production of alcohols, aldehydes, &c., and the slow oxidation of hydrocarbons under high pressure; and equilibrium in CO-H_2-CH_3-OH, &c., systems at high pressures. Another important aspect of his research work was the investigation of the phenomenon of spin in gaseous detonations and the influence of strong electro-magnetic fields thereon.

Prof. Bone, in accepting the Medal, said that he and his colleagues at South Kensington, and those who had worked with him in other places, derived deep satisfaction from the fact that their work was so highly appreciated by a Society devoted to the applications of chemistry to industry.

FORTY YEARS OF COMBUSTION RESEARCH.

By Prof. W. A. Bone, D.Sc., Ph.D., F.R.S.

In his address, Prof. Bone said there had been four outstanding periods in experimental combustion research. The first, associated with the work of Robert Boyle, Robert Hooke, and John Mayow, extended through the reign of Charles II., and was contemporaneous with the foundation of the Royal Society; the second, which began with Black in 1750 and ended with Humphry Davy some 70 years later, included also the classic discoveries of Henry Cavendish, Joseph Priestley, Scheele, and Lavoisier; the third comprised the work of Bunsen between 1853 and 1877; while the fourth, inaugurated about 1880 by the researches of Mallard and Le Chatelier and of Berthelot and Vielle in France upon the initial stages of flame propagation and the development in detonation in gaseous explosions, as well as by the discovery of the influence of moisture upon the combustion of carbonic oxide by H. B. Dixon in this country, is still unfinished.

In the course of his remarks on the so-called "pressure suppression" in gaseous explosions, Prof. Bone made reference to the fact that the old method for photographing explosion flames, originally used by Mallard and Le Chatelier, and subsequently improved by Dixon and collaborators, had recently been developed marvellously by Mr. R. P. Fraser in his (Prof. Bone's) laboratories. In this latest high-speed camera, an 8-lb. stainless steel mirror was revolved *in vacuo* at any desired constant speed up to 30,000 r.p.m., and projected the image of the explosion flame on to a suitably disposed stationary film. Its analyzing power enabled one to measure with precision periodic flame movements occurring with frequencies up to a million per second. As evidence of this, he mentioned an enlargement of a photograph taken by it of a $2CO + O_2$ detonation in a tube of 0·5 in. internal diameter, and repre-

senting the course of events during 1/8000th of a second only. The luminosity of the sinuous track of the "head" of detonation varied intermittently in a manner suggestive of a series of rapidly alternating intensities of chemical action. Also, at each successive increase in luminosity there originated simultaneously (1) a luminous stream travelling forward with a velocity less than that of the flame front, and (2) what appeared to be a compression wave thrown backwards through the burning medium. And the nearly horizontal "bands" were seen to be a series of enhanced illuminations of the medium at the criss-crossing of the other two effects.

The head of detonation seemed to be a localized concentration of highly excited, indeed, of completely ionized, particles, and both "spin" and high flame velocity apparently depended chiefly upon the presence of positive ions in it. Anyway, the whole phenomenon, and detonation itself, it had been found recently, could be destroyed by a strong electric field so arranged as to separate electrons and positive ions and presumably move the latter to the rear of the flame-front. As yet the mathematicians remained in the pavilion, and did not seem eager for the "follow-on."

Hydrocarbon Combustion.

Dealing with hydrocarbon combustion, Prof. Bone recalled the investigations he had commenced in 1897 into the slow combustion of gaseous hydrocarbons, which had since yielded a rich harvest. As the outcome of some 25 years' continuous experimenting upon both the slow and explosive combustion of hydrocarbons, and in each case over a wide pressure range, a whole series of intermediate compounds, including alcohols, aldehydes, and acids, had been isolated, and in most cases also quantitatively determined, and the main and normal source of oxidation shown to involve successive stages of "hydroxylation," as suggested by H. E. Armstrong as long ago as 1874.

Within recent years it had been objected that while the hydroxylation theory might account for the main course of the oxidation, something of the nature of a "peroxide" must immediately result from the primary encounter of hydrocarbon and oxygen molecules, and that "knock" was connected therewith. But notwithstanding repeated long and diligent search for any evidence of such primary "peroxidation," in the cases of methane, ethane, propane, or ethylene, he had never succeeded in finding any; on the contrary, the only recognizable initial product was always the monhydroxy body, and no peroxide-formation (if any) occurred until after there had been a certain accumulation in the system of aldehyde vapours which were very prone to peroxidation.

Another arresting result of the researches had been the proof they had afforded of the vastly superior affinity of hydrocarbons, as compared with either hydrogen or carbonic oxide, for oxygen in explosions. Apparently, as Prof. Armstrong had put it, it was not a case of kinetics, but rather of ballroom tactics, oxygen molecules preferring the good-looking hydrocarbon partners, and leaving the plainer hydrogens as "wallflowers," purporting that there were more things in combustion than were yet dreamed of in our philosophies.

Surface Combustion.

He then went on to discuss the work with which he has been associated in connection with surface combustion, and his realization of processes of incandescent surface, combustion, which had been adapted to "radiophragm" heating, in which the explosive mixture was allowed to flow under slight pressure through a porous diaphragm of refractory medium and caused to burn flamelessly at the surface of exit, which was thereby maintained in a state of red-hot incandescence; to the heating of crucible and muffle furnaces, &c.; and to steam raising in multi-tubular boilers. He had lectured on the subject of surface combustion in several countries. He uttered the warning that, while much still remains to be done in the way of clarifying the subject of surface combustion by further experiment, we should beware of the creeping in of mystical notions that would blur and distort our vision. When one heard not only of supposed "de-activations" on the hot walls of containing vessels, but also of reaction-chains executing Brownian increment thereon, one wondered whether, were Vernon Harcourt to come to life again in Oxford, he would not be incited into breaking heads against laboratory walls!

Dr. Bone told an amusing story of a visit to America in connection with a lecture on surface combustion. In August, 1911, he received a cabled invitation to expound and demonstrate it experimentally at the annual congress of the American Gas Institute at St. Louis on Oct. 19 of that year, all expenses to be paid by his hosts. Accordingly, he and his assistants took out about a ton of apparatus and duly lectured and demonstrated to an enthusiastic audience for more than three hours on the afternoon in question, "the longest infliction I have ever perpetrated." Immediately afterwards they were banquetted for some hours with topical music and pictorial interludes in real Western style, and, on his rising to respond to the toast of his health, the band struck up "The Man that Broke the Bank at Monte Carlo." On inquiring what it all meant, he was told that the expenses of himself and his assistants had literally cleaned out the American Gas Institute who had, perforce, to send the hat round their Industry to meet them.

Ignition Phenomena.

Coming to ignition phenomena and initial flame movements, he said the results of the experimental work might be summarized by saying that the ignition of a gaseous explosive mixture so far from being a simple matter, involved many different factors, and that it was hardly possible to give a rigid definition of what was termed its "ignition temperature," which, indeed, could not be regarded as a physical constant, since it undoubtedly varied with environmental circumstances. They could, however, determine experimentally with fair precision, the lowest temperature at which a particular mixture would ignite in given circumstances; but in every case the time factor or lag (presumably an induction period) was of great, and often paramount, importance.

In the discussion of gaseous combustion at high pressures, he said that several lines of both direct and cumulative evidence, chemical and spectrographic, all seemed to converge in the conclusion that carbonic oxide could and did burn in two ways—*i.e.*, (1) directly, without any intervention of steam, and (2) indirectly, either through it or as the result of its intervention. Pressure certainly favoured the former; the characteristic blue colour of carbonic oxide was a sign of it, and N_2 activation in high-pressure CO-air explosions a consequence thereof. He was convinced that in high-pressure CO-air or CO-oxygen explosions the combustion was mostly, if not wholly, direct; and he believed that Dixon fully concurred in the conclusions. Moreover, evidence was accumulating that the presence of steam was unnecessary in the combustion of hydrocarbons, though in certain circumstances it might shorten both the "induction" and "reaction" periods in their slow combustion.

Amid the welter of new theories and speculations, he concluded, they needed reminding that chemistry was an experimental science, where progress depended on accurate and completely analytical operations under experienced guidance, and not a facile affair of mere manometer readings, pressure curves, and logarithmic deductions. And now, as ever, the greatest need was the discovery and establishment of facts, which should always precede and control their theories. For, as Joseph Priestley had truly said, "Speculations without experiments have always been the bane of natural philosophy."

Perhaps the most important discovery a man could make in 40 years was that it took nearly as many for him to learn how to devise and carry out a good experiment that could be trusted to give a correct answer to the question involved, so complex was the subject and full of pitfalls for the unwary. Why should hard Fate cut short our days just when we feel that with but a few more we could repeat our work in the light of our experience and rebuild the house on better lines and upon a foundation perhaps more enduring? Yet, seeing that such could not be, he accepted the Society's Medal as a sign that, however imperfect their handiwork, the builders had not wrought in vain.

Vote of Thanks.

Mr. W. H. Cadman, proposing a vote of thanks to Prof. Bone for his address, said Prof. Bone's work demonstrated how chemical science, if it were to be of real value, must be based on accurate and sound experimentation. He recalled a warning uttered by Prof. Bone on a previous occasion to certain young chemists who were rather prone to publish unfinished, scrappy work. He had accused them of suffering from "intellectual measles;" and, furthermore, had suggested as a cure large doses of gas analysis. Again, he recalled that Prof. Bone was a firm believer that in the not far distant future it would be possible to use pulverized coal, de-ashed, as a fuel for internal combustion engines of the Diesel type.

Dr. Dunn (the newly-elected President) seconded the vote of thanks, which was carried with acclamation.

A specially bound hand-book of the meeting was presented to Prof. Bone as a memento of the occasion.

Special Tariffs for Power Gas

F. Schäfer, in *Wasser und Gas* of June 1, 1933, refers to the great advances which have been made in the design of gas engines and puts forward a plea for special tariffs for power gas.

Some forty years ago, small gas engines were widely used in sizes ranging mostly between ½ and 6 H.P. The largest size available with a single cylinder was 30 H.P. The fuel consumption averaged about 12,000 net B.Th.U. per H.P./hour. The advent of the small electric motor was largely responsible for displacing small gas engines, while the medium-sized engines were displaced by suction gas or crude oil motors. The result is that the present generation of gas engineers in Germany knows very little about gas engines and therefore fails to realize the potentialities which gas engines offer in the extension of the sale of gas.

The factors responsible for the displacement of gas engines were (1) the small size of the available engines, (2) their high cost due to the great weight of the slow-speed engines which were mainly of the single-cylinder type, and (3) their high operating costs due to the high price charged for gas.

Improvements in gas engine design have involved a continuous increase in the power output per cylinder and the introduction of the light-weight, high-speed, multi-cylinder engine. Furthermore, in many localities in Germany special tariffs for gas have been introduced, and gas is sold, under them, at prices which would have been regarded as economically impossible a few years ago. Generally these tariffs are stated to be applicable to industrial fuel gas, to gas used in the bakery trades, and to gas for use in central heating plant. It seems probable that these tariffs were not stated to be applicable to power gas, also, merely because the former widespread application of gas engines had been lost sight of, and modern developments in gas engines and the potentialities offered by them had not been realized. In future, it should be specifically stated that the special tariffs are applicable to gas used for power purposes.

It is difficult to see why, in cases where gas is sold in winter for space heating, at anything between 2s. and 1s. 6d. per 1000 c.ft., a higher price should be demanded from a fairly heavy consumer of power gas. On the contrary, a specially favourable rate should be quoted, since the power demand is spread over the whole year. With a price of 3·3d. per therm for gas, the present-day gas engine can often compete with a crude oil engine or a motor, at any rate where medium engines—say, between 15 and 150 H.P.—are concerned. Where there is a gas grid and gas can be sold at 2d. per therm or less, a large gas engine can even compete with a steam-turbine in some cases.

The development of large gas engines has been brought about by the adoption of double-action in place of single-action cylinders, by a tandem construction, by suitable design of the cylinder heads and careful cooling of the pistons and valves, by complete washing out of the combustion gases, and by supercharging. The result is that slow-speed horizontal gas engines developing several thousand horse-power per cylinder are not infrequent, and multiple-cylinder engines up to 10,000 H.P. are now successfully in continuous operation. At the same time, also, high-speed, multi-cylinder engines of the hammer type have been constructed in ever-increasing sizes, and the substitution of the four-stroke principle by the two-stroke principle has enabled the cost to be reduced and the uniformity of operation to be increased. Modern engines of this type (100 H.P. and larger) have a fuel consumption no more than 8000 net B.Th.U. per H.P./hour even at two-thirds load and can be used for motive purposes and in many cases where Diesel motors are employed. Improvements have not been confined to large engines since highly efficient small engines are now also available. In some makes, the engines can be driven with either gas of low or high calorific value or liquid fuel at will, the change-over being easily effected.

The subject of gas engines is but rarely dealt with at conferences or in the Technical Press in Germany, though the reverse is the case in England and America. It is therefore easy to understand why the use of gas engines is now so widespread in English gas-works. In Germany, also, propaganda and a suitable price for gas should enable gas engines to assume, once more, their former importance.

The Gum Problem in the Distribution System*

By J. A. Perry, United Gas Improvement Company.

The gum problem requires serious consideration, and a satisfactory solution must start at the source of trouble, the manufacturing plant, and terminate at the consumer's appliance. I shall not attempt in this short paper to go into great technical details.

Our technicians now recognize two distinct types of gum. The first type is formed only in the liquid phase and is ordinarily encountered only in carburetted water gas or mixed gas. It is formed by the polymerization and oxidation of condensed hydrocarbons, and its formation is greatly accelerated by the presence of sulphur compounds which act as catalysts. This type of gum appears as deposits in compressors and certain types of works meters, on the air side of governor diaphragms, on the diaphragms, valves, and valve seats of consumers' meters, and in services and house piping, &c.

Since liquid phase gums will not form until after the hydrocarbons have first condensed from the gas, evidently we can prevent their formation if the gas leaving the plant has a hydrocarbon dew point low enough to prevent the condensation of any light oils in the distribution system. This low hydrocarbon dew point may be obtained either by cooling, using some form of refrigeration system, compression, or a combination of cooling and compression, or the hydrocarbons themselves may be removed to a point where they are not deposited out as drip by oil scrubbing. The difficulties resulting from liquid phase gums can be greatly mitigated by using adequate scrubbing and condensing facilities in the plant and by keeping the oxygen content of the gas at the lowest practical point.

The vapour phase gum is commonly found in coal gas, but has also been found in carburetted water gas, and it is now an acknowledged fact that it is caused by the reaction of oxides of nitrogen with the hydrocarbons and the oxygen in the gas. The U.G.I. Laboratories have found that there are more than twenty-seven hydrocarbon compounds that react with oxides of nitrogen to form gum. This gum not only deposits in compressors, meters, &c., as does the vapour phase gum, but since it exists in the gas as a smoke of solid or semi-solid sticky particles it deposits at points where the temperature would prohibit the formation of vapour condensate. The amount of gum deposited is small, but a surprisingly small amount of gum will give trouble in automatic controls, pilot valves, &c.

The cure for the vapour phase gum trouble is to reduce the oxides of nitrogen as much as possible, and preferably completely remove them at the plant; and there is the rub. One must have fully developed some test that is reliable for the determination of the minute quantities of these substances in the gas. Over a two-year period the U.G.I. Laboratories have developed a test which is relative and will give the same results when conditions are the same even though it may not indicate the exact amount of oxides of nitrogen in the gas. Armed with this test we were able to establish the relative amounts of oxides of nitrogen in the gas at various parts of the scrubbing, condensing, and purification systems. By careful follow-up we found that the oxide purifiers for removing hydrogen sulphide would also largely remove the oxides of nitrogen. Also that seemingly without rhyme or reason the purification oxide when activated and put into use will give off the oxides of nitrogen to the gas. Without going into further details, I will state that through proper arrangement and use of oxide purifiers we have found it possible to stabilize conditions so that the total oxides of nitrogen leaving the purifiers will run from 4 to 10 grammes per million by our tests and such plants can be operated on the average to, say, 6·5 grammes per million or, say, 1/10 grain per 1000 c.ft. We are now engaged in testing our materials and methods which promise to reduce these traces of oxides of nitrogen to an average of one-third of this, or, say, to 1/30 of a grain per 1000 c.ft.

The needle valve type of pilot, particularly the small flow 2/10 to 3/10 c.ft. per hour, is easily and quickly stopped by the vapour phase gums. A gas containing 1/10

* Paper presented before Tenth Annual Distribution Conference, Pittsburgh, Pa., April 3-4, 1933.

of a grain of the oxides of nitrogen per 1000 c.ft. when aged for 18 to 24 hours will stop an ordinary Rutz lighter pilot in from 10 to 15 days. With greater quantities of oxides of nitrogen and less time to age the pilots will stop up sometimes even as quickly as in 6 to 8 hours.

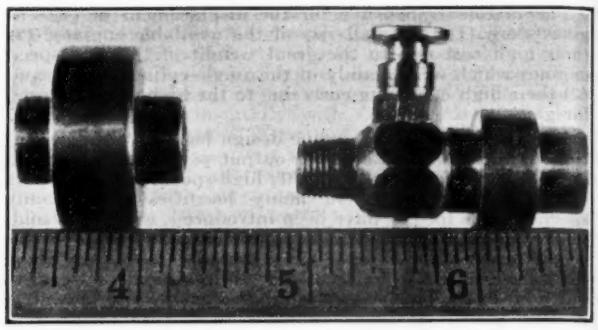
It is a fortunate thing for the distribution or service man that many things are operating in his favour. The surfaces of the holders, mains, services, accumulated deposits, &c., are all acting to absorb the oxides of nitrogen and to cause some of the gum particles that have formed to drop out. The meter and house piping come into play similarly. Conversely, if the gas has been running high in oxides of nitrogen and these facilities have absorbed them and the gas should run low in oxides of nitrogen, these absorbing surfaces will give off the oxides of nitrogen to the gas. Possibly this can be illustrated by some tests we have made in the laboratory with meters and house piping. We have taken both a dipping and non-dipping meter from service and found that by maintaining a temperature of 100° to 140° F. and passing gas through them at the rate of 6/10 c.ft. per hour, supplying three pilots, that the pilots would stop in from 60 to 150 hours, whereas the same kind of a gas going through the new unused meters did not stop pilots with gum. Conversely we have doctored gas with nitrogen peroxide (NO_2), and have found that pilots on the outlet of a meter and service piping assembly lasted longer than those on the inlet. Where only the amount of gas consumed by the pilot was flowing through the meter and piping, the pilot on the outlet lasted thirteen times as long as on the inlet to the assembly. When we consider the fact that the meter may be supplying only the pilot from 80% to 90% of the time we can see the reason why we do not have a great many more pilot outages than the relative small number that now give us so much concern.

Having reached the conclusion that oxide purifiers and even liquid purification plants with oxide catch boxes can be operated or stabilized largely to remove the oxides of nitrogen from gas, and thus largely reduce the complaints of pilot outages, we knew from experience that there would still be occasional serious stoppages such as on automatic and time-operated ovens. We concluded that a satisfactory substitute for the needle valves for controlling small flows of gas for pilots must be found, and we promptly set about to secure a solution to the problem. I am glad to say we have found the solutions. They have been worked out in suitable forms for use on both new or old appliances. As an illustration of our success we have severely doctored the gas and made comparative tests using ordinary Rutz lighters and our improved pilots. The ordinary lighter goes out in from 10 to 48 hours, whereas after 25 days' operation the substitute lighters show no diminution in size and flame. Allowing for service conditions, the beneficial effects of the meter and house piping, &c., one of our laboratory assistants has estimated that these new types of pilot lights should last at least 13 years without a stoppage.

Several variations in pilot controls using the same principle were tried out, and two types developed which gave practically undiminished flow when using gas heavily inoculated with NO_2. We have fully developed one of these two types of controls, so that the same parts can be used on either the Rutz push button type lighters or on the automatic ignition types of lighters.

The two pilot controls illustrated are not adjustable and were designed for 4 in. of burner bar pressure and 0·2 c.ft. per hour for the push button type and 0·4 c.ft. per hour for the automatic ignition type.

In order to take care of all conditions, designs have been worked out with sufficient parts so that adjustment can be made at the time of installation for any particular condition to give a flow of 0·2 to 0·5 c.ft. per hour as may be required for the particular pilot or the particular pressure condition even if the pressure should be as low as 2¼ in. at the burner bar or as high as 10 in. at the burner bar.



These adjustable types of controls will be slightly larger than the non-adjustable types shown in the illustration.

One thousand of the non-adjustable types of pilots have been ordered for trial by the Philadelphia Gas Works Company. They will be made available to a few other companies that desire some for trial, and as soon as it appears that the Gas Industry will use them on a large scale, arrangements will be made to produce and furnish them at reasonable prices to the Industry and to the appliance manufacturers.

Summing Up.

Gum formation in the distribution system of a manufactured or mixed gas situation can best be reduced by proper and suitable treatment of the gas at the plant. Needle valve stoppages of appliances can best be further reduced by substituting new non-gum stop pilots on old appliances where complaints occur, and by requiring all new appliances to have these new types of pilots.

NOTES ON PLANT AND PROCESSES

A Continuous Gas Indicator.

A new instrument for automatic industrial gas analysis, designed by Mr. I. Fagelston, is announced by Messrs. Griffin & Tatlock, Ltd., of Kemble Street, Kingsway, W.C. 2.

An important application of the continuous gas indicator in connection with coal gas manufacture, low-temperature carbonization, and coke oven plant, is the determination of the benzole content of the gas before and after scrubbing. The sensitivity is very high and residual concentrations as low as 0·1% can be indicated with accuracy.

The instrument is also very valuable for determining the operational characteristics of materials like adsorbent carbon and iron oxide and for ascertaining when these are nearing exhaustion.

It also enables constituents like CO_2, H_2S, and moisture, &c., in coal gas or similar gas to be continuously indicated, and it may be used for determining the composition of coal gas-air mixtures with a view to determining the existence, and isolating the source, of gas leaks from mains.

The continuous gas indicator is also of considerable value for ensuring that tar stills are safe before cleaning and repair.

The indicator has a number of important applications in connection with power gases and combustion control. It may be used to indicate continuously composition changes in coal gas, oil gas, water gas, and producer gas during manufacture. Another application is to the determination of the CO_2 content of the gases resulting from combustion, whatever the fuel, with a view to improving combustion control and efficiency. Changes in the CO_2 content can be followed up fully with a time lag which need be no greater than a fraction of one minute.

Blast Furnace Gas Cleaning.

We are informed by Messrs. Lodge-Cottrell, Ltd., that they are at present engaged upon the extension of the blast furnace gas cleaning plant required in connection with the new works which Messrs. Stewarts & Lloyds, Ltd., are laying down at Corby. Messrs. H. A. Brassert & Co., Ltd., are Consulting Engineers for the complete scheme.

Messrs. Lodge-Cottrell, Ltd., supplied electrical precipitators some six years ago, which constituted the rough cleaning plant then installed. As the blast furnace gas will now be used in stoves of modern design with close packing, also for heating the coke ovens, and, mixed with coke oven gas, in the steelworks, a fine cleaned gas is required.

A second stage is therefore being added, which will increase the capacity of the plant to 5½ million c.ft. of gas per hour (N.T.P.). This volume will be cleaned down to the guaranteed figure of 0·02 grammes/cub.m. (0·0088 grains/c.ft.). The bulk of the dust—well over 90%—will be brought down dry, as hitherto. After cooling in slat towers, this semi-cleaned gas will be subjected to a second

treatment in electrical precipitators, which will eliminate the remaining dust and all the moisture particles.

The water used in the slat towers will be re-circulated without settling, as this is unnecessary owing to the small amount of dust washed out of the gas in these towers. The requirement of a high degree of water economy will thus be met.

Aluminium in the Gas Industry.

The applications of aluminium in gas manufacturing, utilizing, and ancillary plant form the subject of an interesting brochure recently published by the British Aluminium Company, Ltd., of Adelaide House, King William Street, London, E.C. 4.

The lightness of aluminium is one of those outstanding facts of general knowledge which impresses itself upon the mind, and so strikingly different is aluminium in this respect from other common metals that this characteristic outshadows its other properties. Yet these other properties are often of even greater importance in industry than its low weight, and, as a particular instance, the quantities of aluminium employed in the various branches of the Gas Industry are used not so much because of lightness, but because aluminium is immune from chemical attack by the majority of the products of coal distillation, by the majority of the bye-products of gas manufacture, and by the products of combustion of gas itself. Further advantages which recommend the use of aluminium in the Gas Industry are set out in an introduction to the brochure.

The adoption of corrugated aluminium sheet in the place of wood or galvanized iron in the rotary washers is suggested, the main advantage of the metal being its greater life and its low weight, enabling more plates to be packed per unit length of shaft. Perforated or expanded aluminium for purifier grids is also recommended.

So far the gasholder itself has not been made in aluminium, though, it is suggested, there is much to be said for this application, and it is common practice to use steel, which, however, is given a surface as close as possible to an aluminium surface by means of aluminium paint. Aluminium paint differs from ordinary paint in that the colouring medium is metallic, and consists of microscopic leaves of aluminium, which, under the action of surface tension, interleave like fish scales and provide a continuous sheath. The protective effect and the value of the reflection factor of this paint are well known.

The use of corrugated aluminium sheeting and aluminium nails is particularly suitable in the corrosive atmospheres of gas-works, while its adoption for machine guards, electrical transmission, fittings in switch rooms, and in connection with the manufacture of gas mantles, &c., is rapidly becoming recognized.

Aluminium for gasfitters' equipment, including trucks, tools, pipe benders, lamps, &c., is particularly useful, while its extensive use in gas appliances, both domestic and industrial, is indicated in the brochure by an extensive illustrated section dealing with a few of the more important of its many applications. These include gas copper tops, casings and trays for steaming ovens, ventilating canopies for large cooking installations, bowl gas heaters, water circulators, gas lighting reflectors and fittings, heating coils for geysers, castings for industrial furnaces, and so forth, the advantages of aluminium in each particular instance being clearly set out.

The booklet is of value in that it reviews in a general way many applications of aluminium in the Gas Industry—some of them old-established, others suggestions of potential value based on tests made only in the immediate past.

Corporation Undertakings' Results.

Abertillery.

The annual report of the Abertillery Gas Undertaking shows that the net total income for the year ended March 31 amounted to £22,499, and the expenditure £17,882, giving a gross profit of £4617. After providing net revenue charges, &c., there is a net profit of £985. The sales of gas for the year amounted to 77,887,700 c.ft.—a slight increase over last year.

Burntisland.

The accounts of the Burntisland Gas Department, on the Firth of Forth coast, show a total revenue of £9087, of which £7736 was for sale of gas and £1023 for residual products. The Council have unanimously resolved to reduce the price of gas by 2½d. per 1000 c.ft., making the price 3s. 6½d. after the August reading of meters.

Darlington.

The sales of gas during the year amounted to 601,596,898 c.ft., compared with 596,580,661 c.ft. during the previous year. The total number of meters on the district was 20,873—an increase of 807.

Manchester.

The quantity of gas sold was 6857 million c.ft., which shows a decrease of 3·03% compared with the preceding twelve months. There has been a reduction in the income from coke, amounting to £14,275. This is accounted for partly by the reduced quantity available for sale and also by the keen competition from furnace coke which still continues. The demand for graded coke for domestic use has been well maintained. The increase of £26,072 in the income from tar is due to the improved conditions of the markets for tar and tar products. The loss of £9680 on the sale of sulphate of ammonia is attributable to over-production in general and the continued depressed state of the demand for this product. The definite sales policy inaugurated in 1928 is still being actively pursued with very satisfactory results as indicated by the following sales, &c., during the year:

	Sold.		On Simple Hire.
	No.	Value.	No.
		£	
Cookers	4,584	33,931	2083
Fires, radiators, &c.	1,503	3,587	2337
Geysers, boilers, &c.	629	3,799	4510
Standard lighting fittings, &c	10,843	19,432	..
Total	17,559	60,749	8930

In addition, 9300 consumers have been added to the Burner Maintenance Service during the year, making a total of 35,508 now under contract for this service. The number of approved applications to be placed on the reduced scale of prices applicable to gas used for manufacturing, &c., purposes received up to March 31 last was 3570, in respect of which the consumption was 1163 million c.ft., or 16·97% of the total sales. Special contracts have been made with 20 consumers for a minimum consumption of 163 million c.ft. of gas per annum, which includes the gas required by gas-fired boilers in five municipal schools.

Rotherham.

The income of the Department shows an increase of £4120 over last year's total, while the increase in expenditure, partly due to the cost of gas-making during the floods last May, is only £1843. The gross profit of £29,875 is £2277 greater than last year. This is responsible for an increased payment of income-tax, and after paying £17,182 for redemption of debt and interest charges there is a net profit of £6220. Out of this, £4175 is handed over to the rates as the cost of gas for public lighting, and the balance, as in previous years, is used to defray capital expenditure not covered by loans. The Rotherham Gas Undertaking is outstanding, in that it can show an increase in the output of gas of nearly 12½%—particularly as this has occurred during a period of intense industrial depression. The sales for 1932-33 were 858,826,100 c.ft. In addition, the Department has been responsible for the sale of 19,289,400 c.ft. at Conisborough, previously supplied by the Conisborough Gas Company. A gratifying feature is the increase of 2·1% in the sales of gas for domestic purposes. During the year the Committee introduced the two-part tariff system of charging for gas. Already in Rotherham 120 consumers have signed two-part tariff agreements, including 45 householders who have installed complete gas equipment in place of coal. The increase of over 88 million c.ft., or 24%, in the sales of gas for industrial purposes justified the expenditure on this side of the business. In co-operation with the Rotherham Technical College assistance has been given to local industrial firms. Rotherham has taken a prominent part in the investigation of the use of high-pressure gas for mechanical transport.

Gas Companies' Results in 1932.

Berwick.

The annual report of the Directors of the Berwick and Tweedmouth Gaslight Company for the past year has just been issued, and indicates that all departments have worked very satisfactorily. After carrying £360 to general reserve account, the net profit realized is £2102, and the Directors propose that there be paid a dividend of 5%, free of income-tax, upon the £32,580 capital of the Company. This will absorb £1629; the remaining £473 they propose be carried forward to next year's accounts. The Chairman, Mr. R. P. Lee, having expressed, in October last, his desire to retire from public life and from the Board, the Directors, acting under powers vested in them, elected Mr. Thomas Wilson to fill the vacancy. The Board received Mr. Lee's decision with much regret, he having served the Company

as a Director for 32 years. In the same month the Company suffered a further loss when death removed Mr. Robert Boston from their midst. Mr. Boston had been a Director for 20 years, and had always taken a deep interest in the Company's welfare.

Brechin.

The amount of gas made by the Brechin Gas Company during the year ended June 30 last showed an increase of 1,800,000 c.ft. over the production of the previous twelve months. A gross profit of £3772 was made on the year's working, and, after providing £500 for depreciation and £500 for reserve, a balance of £2919 was available for distribution.

General Gas and Electricity Company.

The Directors' report of the General Gas and Electricity Company, Ltd., presented at the Annual Meeting on July 13, showed that the profit for the year ended March 31, 1933, was £5289, which has been carried to the profit and loss (net revenue) account. After charging £517 to provide for income-tax, writing off £300 for investigation of properties, and carrying £650 to reserve, there remained a balance of £4763, out of which the preference dividend for the half-year to March 31, 1933, has been paid. The Directors recommended the payment of a dividend on the ordinary shares of 3% for the year, and that the balance of £1703 be carried forward.

REGISTER OF PATENTS

Prepayment Meters.—No. 387,678.

UNITED GAS INDUSTRIES, LTD., of Lincoln's Inn Fields, W.C. 2, SMITH, E. W., of Kennington Park Road, S.E. 11, and CHARLES, A., of Streatham Vale, S.W. 16.

No. 13,026; May 2, 1931.

This invention is concerned with coin freed mechanism for gas meters adapted for automatically selective operation by coins of more than one value and provided with an epicyclic gear to transmit movement from the coin holder mechanism to the quantity mechanism, which epicyclic gear in itself and without the aid of additional gearing exterior to the sun wheels gives the required reduction ratios for the several values of coin. The epicyclic reduction gear is provided with a sun element for each kind of coin, the sun elements transmitting to a driven element through a planet member an angular movement corresponding to the value of the particular coin inserted.

Measuring wheels are provided corresponding to the values of the coins, and are respectively connected with a sun wheel and sun pinion which are co-axial and independent, while a corresponding integral or connected co-axial planetary wheel and planetary pinion in engagement respectively with the sun pinion and sun wheel are mounted upon a planetary cage, the latter being adapted to rotate upon the common axis of the sun wheel and the sun pinion.

A differential quantity mechanism is provided to receive movement from the driven element of the epicyclic reduction gear. A valve-operating element is provided that is caused to open or close the valve during a portion of the travel of the driving member which receives movement from the quantity mechanism and the meter mechanism and by which the valve-operating member is actuated, under conditions permitting repeated operation of the coin holder mechanism to cover a large range of prepayment.

No. 387,680.

UNITED GAS INDUSTRIES, LTD., SIMPSON, S., of Exmouth, SMITH, E. W., and ROBINSON, S., of Liverpool.

No. 22,519; Aug. 8, 1931.

This invention is to prevent the prepayment of more than a determined quantity of gas to be supplied, and to indicate at any time the quantity of the gas for which prepayment has been made.

The opening by which the coin inserted into the holder of the meter is transferred to the coin receptacle is obturated by a closure member carried by a lever pivoted to permit movement of the closure member about an axis parallel with the axis of the coin holder and operated from a moving element of the mechanism after a determined number of coins have been introduced.

The lever carrying the closure member is moved for the obturation of the coin discharge opening by a cam element and an element of the mechanism having relative movement.

The number of coins introduced into the holder and transferred to the coin receptacle is registered upon a scale for the purpose of indicating the amount of the gas for which prepayment has been made by an indicating device supported in fixed relation to the lever.

Governors.—No. 388,042.

R. & A. MAIN, WORTLEY, G. W., and ROBINSON, H. N., all of Grosvenor Gardens, S.W. 1.

No. 23,060; Aug. 15, 1931.

According to this invention a gas pressure governor is provided with a small breathing hole in the cover plate, a valve controlling the breathing hole, and means for operating the valve, which means is so controlled by a change in the difference of pressure on the two sides of the diaphragm that the valve is closed when the ratio of the pressure on the outside of the diaphragm (*i.e.*, on that side adjacent the breathing hole) to the pressure on the inside of the diaphragm is greater than the value obtaining under the normal range of working conditions. Thus during normal conditions, the breathing hole will always be maintained operative. It might be, however, that the breathing hole could be closed although there is no leak in the diaphragm when the pressure on the inside of the diaphragm is at the minimum value under working conditions.

When there is a leakage through the diaphragm, the operation of the device depends upon a pressure being built up on that side of the diaphragm on which the breathing hole is situated. To enable this building up of pressure to take place, the breathing hole must be of such a size as to pass less gas than that leaking through the diaphragm. Since when a leak develops the difference of pressure on each side of the diaphragm is greater than the difference of pressure on each side of the breathing hole, the breathing hole can be larger than the hole or fracture in the diaphragm. The size of the breathing hole should, however, be as small as possible without influencing a damping effect on the normal movement of the diaphragm, since the smaller the breathing hole is, the smaller will be that leak which will close the valve.

The diaphragm is operatively connected to the valve for closing the breathing hole. With this arrangement, under normal conditions the diaphragm is distended by the pressure of the gas supply on one side of it. Should a pressure be built up on the other side by a leak in the diaphragm, the diaphragm will collapse and in collapsing will cause the breathing hole valve to be closed.

Coke Oven Doors.—No. 388,537.

WOODALL-DUCKHAM (1920), LTD., and MARR, J., both of Victoria Street, S.W. 1.

No. 609; Jan. 8, 1932.

This invention relates to coke ovens of the kind in which there is employed a door closure comprising a lute packing and a packing frame adapted to serve as a self-sealing device.

The luted closure comprises a wedge-shaped gap formed between the door and the jamb plate, this gap being outside the self-sealing closure. In one form of construction, a side portion of the door frame, preferably the jamb plate, has one portion which extends, with clearance to accommodate the knife edge of the self-sealing device, over a corresponding portion of the door. The self-sealing device, which is in the form of a knife edge, extends all round the door—that is, around the top, the bottom, and the sides. The self-sealing device is provided with screws to ensure metal to metal contact in the event of irregularities on the frame.

Gas Regulators for Steam Boilers. No. 390,314.

LARKIN, H., of Wimbledon, S.W. 19.

No. 7786; March 16, 1932.

The object of this invention is to prevent the forcing of a gas-fired steam boiler, by an excess of gas supply, until steam has first been raised in the boiler up to, say, 5 or 10 lbs. or other required set pressure, the regulator then automatically functioning to allow of full gas supply until the maximum working steam pressure in the boiler, say, 55 lbs., is reached. The regulator then functions either to reduce the gas supply or cut-off the supply until the pressure in the boiler falls to, say, 50 lbs., or, if the gas cock is turned off by hand, automatically to close the gas passage to the burner until such time as the gas cock is turned on again and the burner re-lighted.

The regulator also functions to cut out the gas supply to the burner in the event of the gauge glass of the boiler breaking or the burning out of a fusible plug, with consequent sudden loss of steam pressure.

A by-pass pipe with pilot light is associated with the gas cock and burner to effect the re-lighting of the burner, the pilot light not only serving as a visible indicator as to gas being ON or OFF, but also preventing the cooling of the boiler during frosty weather.

East Hull Gas Bill

First Application of Wrottesley Committee's Proposals

The Board of Trade has lost no time in putting into effect the proposals of the Gas Legislation Committee with regard to the calculation of profits for the purpose of dividend payment under the basic price. Clauses to give effect to this are included in the East Hull Gas Bill which was before the Unopposed Committee of the House of Commons on Tuesday, July 11, and during the proceedings it was mentioned that similar clauses are being inserted in two Special Orders now under consideration by the Board of Trade.

Col. Cox (Messrs. Dyson, Bell, & Co., Parliamentary Agents) appeared before the Committee on behalf of the promoters—the East Hull Gas Company—and pointed out that the three main objects of the Bill are to consolidate the existing Acts of Parliament under which the Company operates, these dating back to 1867, to empower the Company to raise £50,000 additional capital with £30,000 borrowing powers, and to convert the Company into a basic price Company. Pointing out that the Bill was on the accustomed lines in such cases—there being the usual clauses regulating the supply of gas together with various protective clauses—Col. Cox said that the important matters to be brought before the Committee were contained in a report upon the Bill by the Board of Trade, all of which had been met. As regards the basic price, the Bill originally asked for a figure of 8·8d. per therm in the Hull area with a differential of not more than 3d. per therm in the outer area, but the Company had agreed a basic price with the Board of Trade which could be said to be considerably lower than the figure originally asked for by the Company, the price in the Bill now being 8·2d. per therm, retaining the 3d. differential.

The other important matter mentioned in the Board of Trade report related to the manner in which the basic dividend of 5% should be arrived at, and it arose out of the recommendations made by the Gas Legislation Committee, more familiarly known as the Wrottesley Committee. This Committee recommended a new form of clause in substitution for what was known as the South Suburban Clause, and under this the dividend authorization of the Company was based on a graded scale which took into account the extent to which gas was supplied to various large consumers below the charge made to the ordinary small consumers. Under Clause 97 of the Bill the Company was to exhibit in a conspicuous position at its principal office a notice stating the price per therm at which they were prepared, for the time being, to sell gas in the Hull area and the outer area respectively to persons with whom the Company had not entered into a contract in writing to charge any other price than this advertised "ordinary" price. Under Clause 99 the profits of the Company were to be arrived at after taking into account the supplies given below the ordinary price, the object being to ensure that the Company shall only get the same relative amount of profit on the lower priced gas as on the ordinary priced gas, without penalizing the small consumers by charging high prices to enable very low prices to be charged to large industrial consumers in an endeavour to meet the competition of electricity and oil. The whole object was to protect the small consumer and at the same time allow the Company to enter into contracts for gas at low prices in the case of large industrial consumers in order to meet the competition of electricity and oil; therefore, instead of giving the same dividend authorization from the gas sold at whatever price it was sold, as under the South Suburban Clause, the dividend authorization was graduated so that the lower the price the less was the amount of dividend authorized. Admitting that an explanation of the new legislation with regard to division of profits was exceedingly complex, Col. Cox called attention to the presence of Mr. Ronca, who was a member of the Gas Legislation Committee, and also to the fact that Sir Frederick Liddell (Speaker's Counsel)—a member of the Unopposed Committee of the House of Commons—had approved the Clause and was, to a large extent, responsible for it.

The CHAIRMAN said that as this was the first Gas Bill which contained legislation on the lines recommended by the Gas Legislation Committee in regard to this particular matter, it would be as well to have the position explained as fully as possible.

Col. COX said it was the fact that this was the first Bill of the kind, but he believed that certain Special Orders were now before the Board of Trade in which the Board proposed to adopt recommendations of the Gas Legislation Committee. Perhaps Mr. Ronca could indicate to the Committee the policy of the Board of Trade in this matter.

Mr. RONCA said the position was that two Special Orders were now before the Board of Trade in which it was proposed to adopt the recommendations of the Gas Legislation Committee in regard to the division of profits in relation to the basic price; and, although, as Col. Cox had said, the Clause seemed complicated and was lengthy, it was of necessity so because it had to distinguish between three classes of supply—namely, those given at not more than 30%, 40%, and 50% below the basic price. In that way the several dividend authorizations for the different supplies could be aggregated so that the authorization for the dividend to be paid in respect of the whole of the gas supply could be arrived at.

The CHAIRMAN asked if the position could be explained in a manner which could be easily understood by the Committee.

Col. COX said it was really a mathematical calculation which called for a piece of chalk, a blackboard, and a duster—perhaps the latter more particularly!

Mr. *A. White* (Messrs. Cash, Stone, & Co., Chartered Accountants) was then called by the promoters to give evidence on the matter, and he handed into the Committee a table of figures showing how the various dividend authorizations for various price gas supplies would be arrived at under the new Clause. He added that the Gas Legislation Committee had decided upon the discounts mentioned in the Clause after examining the accounts of a large number of typical companies, so that the Clause was not a shot in the dark, but was based on the actual working of many companies.

Col. COX said no doubt the Committee were familiar with the fact that the electricity supply authorities were more and more framing their charges on what were known as two-part tariffs, under which there was a high initial charge to cover standing charges, with a low running charge for the units consumed; and gas companies were finding themselves compelled to adopt something akin to this. Under the South Suburban Clause, however, that was impossible, and the Gas Legislation Committee therefore recommended this gradually diminishing scale of dividend together with a minimum charge to be made in the case of those consumers who used so little gas as to be uneconomic, and whose case was met by the two-part or similar tariff. This minimum charge, however, had not been included in the East Hull Bill for technical reasons concerned with Standing Orders.

In answer to a remark by the Chairman, Col. COX said that this new proposal was an elaborate device to dangle a bunch of carrots in front of the gas company to induce them to reduce their expenses so that they could reduce the price of gas to all classes of consumers and at the same time earn something for themselves and the people working for them.

The preamble of the Bill was then formally proved, and, as already mentioned, the Bill was ordered for third reading.

Parliamentary Intelligence.

[From Our Special Correspondents.]

House of Lords.

Private Bills.

The Commercial Gas Bill has been read a third time in the House of Lords, and passed without amendment. The Bill is now awaiting Royal Assent.

The Gas Light and Coke Company Bill has been reported, with amendments, and was read a third time on July 17.

Special Orders.

Special Orders proposed to be made on the application of the Chester United Gas Company; the Watford and St. Albans Gas Company (No. 2 Order); and the Borough of Wallasey have been laid before the House for affirmative resolution and referred to the Special Orders Committee.

The Neath Gas Order and the Herne Bay Gas Order have been reported from the Special Orders Committee and approved by the House.

House of Commons.

Private Bills.

The South Metropolitan Gas Bill has been referred to the Unopposed Bills Committee which is to meet for the first time to-day (July 19), at 3 o'clock. The members of the Committee are as follows: The Chairman of Ways and Means; the Deputy-Chairman; Captain Crawford Browne; Sir Geoffrey Ellis; and Mr. Hanbury.

The East Hull Gas Bill has been reported, with amendments; the Reports to lie upon the Table and to be printed.

Special Orders.

The drafts of Special Orders proposed to be made by the Board of Trade under the Gas Undertakings Acts of 1920 and 1929, on the application of the Borough of Neath and the Herne Bay Gas Company, Ltd., presented to the House on June 15, were approved on July 17.

Drafts of Special Orders proposed to be made on the application of the Chester United Gas Company; the Borough of Wallasey; and the Watford and St. Albans Gas Company have been presented to the House and ordered to lie upon the Table.

Launching of Petrol from Coal Industry.

Government's Announcement.

As will be seen from our News Columns to-day, the Government have decided to give active support, in the shape of a guaranteed preference of 4d. per gallon, to the manufacture of petrol from British coal, shale, or peat; and the Prime Minister's important announcement on July 17 on the subject is published.

Mr. Lansbury (Leader of the Opposition) gave notice on behalf of the Opposition that they would choose this subject for debate on one of the remaining supply days, in order that the House might be in a position to discuss this very important statement.

GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

The gambling atmosphere was again much in evidence on the Stock Exchange last week, and a further large volume of business was recorded in industrials. Prices quickly responded, and so wild were the movements in some of the highly speculative issues that the real investors held off and turned their attention to the more reliable type, for which there was a steady demand towards the close. The lists for the new 4% Australian loan 1943-48 open this week, and, having regard to the sound financial position now attained by that country, the offer at £99% is attractive.

The demand for Gas stocks and shares was heavier last week, and, with few exceptions, movements in prices favoured holders. Preference and debenture issues were in particular request, and inquiries for British 5% preference led to an increase of 5 to 110½. Swansea 5½% gained 1 to 111, and (at the local Exchange) Newcastle 4% preference hardened 1 to par. Gas Light 5½% and 4½% debentures both rose 1 to 114½ and 111½ respectively. Among ordinaries, South Metropolitan was again higher at 127½; Imperial Continental gained a further 2 points to 217; and Newcastle units at 25s. recovered the previous week's drop of 6d. On the Bristol Exchange, Newport (Mon.) 5% maximum stock advanced 1 to 103, and at this price appears to be still rather undervalued when compared with the prices of similar stocks of other undertakings about equivalent in size. A steady appreciation has been taking place, however, and since the commencement of the year the price has risen 9 points.

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *July* 17.

The market for tar products continues steady, and current prices are as under:

Pitch, 80s. per ton f.o.b.
Creosote, 3d. per gallon.
Refined tar, 4d. to 4¼d. per gallon in bulk at makers' works.
Pure toluole, 2s. 4d.; pure benzole, 1s. 9d.; solvent naphtha, 95/160, 1s. 7d.; and 90/140 pyridine bases, about 4s. 3d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

July 17.

The average prices of gas-works products during the week were: Gas-works tar, 32s. 6d. to 37s. 6d. Pitch—East Coast, 80s. to 82s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 80s. to 82s. 6d.* Toluole, naked, North, 1s. 9d. to 1s. 10d. Coal-tar crude naphtha, in bulk, North, 6d. to 6¼d. Solvent naphtha, naked, North, 1s. 5½d. to 1s. 6d. Heavy naphtha, North, 10d. to 11d. Creosote, *ex* works, in bulk, North, liquid and salty, 2d. to 2½d.; low gravity, 2d.; Scotland, 2d. to 2½d. Heavy oils, in bulk, North, 4d. to 4½d. Carbolic acid, 60's, 2s. 7½d. to 2s. 8d. Naphthalene, £9 to £10. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *July* 15.

While prices remain steady, very little fresh business has been placed owing to the Glasgow Fair holidays. Business outside of Glasgow continues quite good, however, particularly in road tar.

Crude gas-works tar.—Actual value remains at 42s. 6d. to 47s. 6d. per ton *ex* works.

Pitch.—Quotations are well held at 75s. to 77s. 6d. per ton f.o.b. Glasgow for export, and 75s. per ton *ex* works for delivery in the home market.

Refined tar to Ministry of Transport specification is leaving the works in large quantities, but prices remain unchanged at 3½d. per gallon *ex* works in buyers' packages.

Creosote oil.—Supplies are not so plentiful and values show a further increase on the week's trading. B.E.S.A. Specification is 2⅝d. to 2⅞d. per gallon; low gravity, 2⅜d. to 2⅝d. per gallon; and neutral oil, 2⅝d. to 2⅞d. per gallon—all in bulk *ex* works.

Cresylic acid.—Although orders are not numerous prices are steady. Pale, 97/99%, is 10d. to 11d. per gallon; dark, 97/99%, 9d. to 10d. per gallon; and pale, 99/100%, 1s. 1d. to 1s. 2d. per gallon—all f.o.r. in buyers' packages.

Crude naphtha is scarce with available supplies commanding 4d. to 4½d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 3d. to 1s. 4d. per gallon, and 90/190 grade 11d. to 1s. per gallon *ex* works.

Motor benzole is difficult to secure, and the value is nominal at 1s. 5d. per gallon f.o.r.

Pyridines.—90/160 grade is 3s. to 3s. 3d. per gallon, and 90/140 grade 3s. 3d. to 3s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole	0 9	to	0 9½	per gallon at works
Motor "	1 4	"	1 4½	" " "
Pure "	1 7½	"	1 8	" " "

Contracts Advertised To-Day.

Coal.
Warrington Gas Department. [p. 168.]
Burton-upon-Trent Gas Department. [p. 168.]

Cookers and Fires.
Warrington Gas Department. [p. 168.]

Fireclay Goods.
Warrington Gas Department. [p. 168.]

Fittings, Taps, Valves, &c.
Warrington Gas Department. [p. 168.]

General Stores (Oils, Paints, Ironmongery, &c.).
Warrington Gas Department. [p. 168.]

Mantles, &c.
Warrington Gas Department. [p. 168.]

Meters.
Warrington Gas Department. [p. 168.]

Oxide.
Warrington Gas Department. [p. 168.]

Pipes, &c.
Warrington Gas Department. [p. 168.]

Tar Stills.
Warrington Gas Department. [p. 168.]

Trade Notes.

"Hurry" Water Heater Company Extensions.

The "Hurry" Water Heater Company, of 39, Broad Street, Birmingham, have recently completed extensive structural alterations to their premises to enable them more adequately to deal with an increasing demand. Their showrooms have been panelled in oak, and a range of their heaters and washers in action is now daily displayed. Enamelled asbestos showing how a modern bathroom may be fitted is effectively displayed with bath and water heater complete and working, to demonstrate economy in use.

STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

Issue. £	Share.	When ex-Dividend.	Dividends. Prev. Hf.-Yr. % p.a.	Dividends. Last Hf.-Yr. % p.a.	NAME.	Quotations July 14.	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Week
1,551,868	Stk.	Apl. 3	7⅞	7	Alliance & Dublin Ord. ...	120—130	...	125½
374,000	"	July 10	4	4	Do. 4 p.c. Deb. ...	85—95*	...	94⅝
557,655	"	Mar. 6	7	7	Barnet Ord. 7 p.c.	157—162	...	...
300,000	1	May 8	1/4⅛	1/9⅛	Bombay, Ltd.	25/— 27/-	...	...
178,280	Stk.	Feb. 20	9½	9½	Bournemouth sliding scale	195—205	...	...
550,050	"	"	7	7	Do. 7 p.c. max. ...	157—162	...	160
439,160	"	"	6	6	Do. 6 p.c. Pref. ...	137—142	...	...
50,000	"	June 26	3	3	Do. 3 p.c. Deb. ...	74- 79	...	...
162,025	"	"	4	4	Do. 4 p.c. Deb. ...	99- 104	...	...
210,000	"	"	5	5	Do. 5 p.c. Deb. ...	120- 125	...	...
357,900	"	Mar. 6	7½	7½	Brighton, &c. 6 p.c. Con. ...	152- 157	...	...
540,000	"	"	6½	6½	Do. 5 p.c. Con. ...	142- 147	...	...
195,500	"	"	6	6	Do. 6 p.c. B Pref.	133—138	...	...
1,487,500	"	Mar. 6	5	5	Bristol 5 p.c. max.	110—111*a*	...	...
120,420	"	June 26	4	4	Do. 1st 4 p.c. Deb. ...	99—100*a*	...	...
217,870	"	"	4	4	Do. 2nd 4 p.c. Deb. ...	99—100*a*	...	...
328,790	"	"	5	5	Do. 5 p.c. Deb.	119—122*a*	...	...
855,000	"	Apl. 3	7	8	British Ord.	147- 152	...	148½—150
100,000	"	June 26	7	7	Do. 7 p.c. Pref.	144- 149	...	146½
350,000	"	"	5½	5½	Do. 5½ p.c. Pref. ..	108—113	+5	...
120,000	"	"	4	4	Do. 4 p.c. Red. Deb. ..	94- 99	...	...
450,000	"	"	5	5	Do. 5 p.c. Red. Deb. ..	103- 113	...	...
160,000	"	June 26	5	5	Cambridge 5 p.c. Deb. ..	115- 120	...	...
100,000	10	May 22	6	4	Cape Town, Ltd.	7- 8	...	...
100,000	10	Apl. 24	4½	4½	Do. 4½ p.c. Pref. ...	6- 7	...	...
150,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb. ...	87- 92	...	...
626,860	"	Feb. 20	6	6	Cardiff Con. Ord.	119- 124	...	...
237,860	"	June 26	5	5	Do. 5 p.c. Red. Deb.	108- 110	...	...
157,150	"	Feb. 20	5	6½	Chester 5 p.c. Ord.	107—112*b*	...	...
98,936	1	May 22	2	2/-	Colombo, Ltd. Ord.... ...	25/—80/-	...	...
24,500	1	"	1/4⅛	1/4⅛	Do. 7 p.c. Pref. ..	18/6- 20/6	...	...
609,204	1	Mar. 20	/11 48	/11 48	Colonial Gas Assn. Ltd. Ord.	17/6- 20/-	...	...
296,053	1	"	1/3'30	1/3 30	Do. 8 p.c. Pref.	1 5/8—1 7/8	...	...
1,796,965	Stk.	Feb. 20	5	6½	Commercial Ord.	112- 117	...	...
475,000	"	June 12	3	3	Do. 3 p.c. Deb. ...	74- 79	...	...
265,272	"	Mar. 6	—	5	Do. 5 p.c. Deb. ...	120- 125	...	120
807,560	"	Feb. 20	7	7	Croydon sliding scale ...	145—150	...	146½—147½
469,590	"	"	5	5	Do. max. div.	101- 106	...	104—106
500,000	"	July 10	5	5	Do. 5 p.c. Deb.	118—123*	−2	...
542,270	"	Mar. 6	7	10	Derby Con.	150—160*c*	...	...
55,000	"	July 10	4	4	Do. 4 p.c. Deb.	80—85*c*	...	...
209,000	"	Mar. 6	5	5	East Hull Ord. 5 p.c. ...	106—111	...	...
179,500	"	Mar. 6	6	6	East Surrey Ord. 6 p.c. ...	120—125	...	125
155,019	"	June 26	5	5	Do. 5 p.c. Deb. ...	115—120	...	...
1,002,180	"	Apl. 3	†5	†7	European, Ltd.	131—136	+1	132—134
19,373,992	"	Feb. 20	5⅞	5⅞	Gas Light & Coke 4 p.c. Ord.	26/— 27/-*f*	...	26/3—26/9
2,600,000	"	"	3½	3½	Do. 3½ p.c. max. ...	85—88	...	86—86½
4,477,106	"	"	4	4	Do. 4 p.c. Con. Pref. ...	99- 102	...	100—102
6,102,497	"	June 12	3	3	Do. 3 p.c. Con. Deb. ...	76- 79	...	77—78
3,642,770	"	"	5	5	Do. 5 p.c. Red. Deb. ...	113- 116	+1	113½—115
3,500,000	"	"	4½	4½	Do. 4½ p.c. Red. Deb. ...	110—113	+1	111—112½
270,466	"	Mar. 6	6	6	Harrogate New Cons. ...	115—120	...	116½
82,500	"	Mar. 6	7	7	Hastings & St. L. 5 p.c. Conv.	138—143	...	...
258,740	"	"	5½	5½	Do. 5½ p.c. Conv.	110—115	...	...
70,000	10	Apl. 24	†10	†10	Hongkong & China, Ltd. ...	14- 15	...	...
213,200	Stk.	Mar. 6	6	6	Hornsey Con. 5½ p.c. ...	122—127	...	...
5,600,000	"	May 22	10	14	Imperial Continental Gas.	212—222	+2	215—220½
223,130	"	Feb. 6	3½	3½	Do. 3½ p.c. Red. Deb.	89—94	...	...
235,242	"	Mar. 6	8½	8½	Lea Bridge 5 p.c. Ord. ...	170—175	...	...
2,145,907	"	Mar. 6	6	6	Liverpool 5 p.c. Ord. ...	125⅝—126⅜*b*	...	...
245,500	"	June 26	5	5	Do. 5 p.c. Red. Pref. ...	103—113*b*	...	...
306,083	"	Jan. 19	4	4	Do. 4 p.c. Deb. ...	101—103*b*	...	...
165,736	"	Feb. 20	8	10	Maidstone 5 p.c. Cap. ...	180—200	...	...
56,176	"	July 10	3	3	Do. 3 p.c. Deb. ...	69—74*	−1	...
75,000	£	June 12	†10	†10	Malta & Mediterranean ...	9—11	...	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	98—103	...	...
231,978	Stk.	Mar. 6	5	5	M. S. Utility "C." Cons. ...	103—108	...	106
818,657	"	"	4	4	Do. 4 p.c. Cons. Pref.	93- 98	...	97⅞—97½
112,126	"	June 26	4	4	Do. 4 p.c. Deb. ...	100—102	...	100½
148,955	"	"	5	5	Do. 5 p.c. Deb. ...	118—118	...	...
675,000	"	21 May '33	16	16	Montevideo, Ltd.	55— 65	...	56
2,661,315	"	Mar. 6	5	5⅓	Newcastle & Gateshead Con.	24/6—25/6*d*	+./6	...
682,856	"	"	4	4	Do. 4 p.c. Pref. ...	99—101*d*	+1	...
776,706	"	July 10	3½	3½	Do. 3½ p.c. Deb. ...	91—93*d**	...	...
277,285	"	May 8	5	5	Do. 5 p.c. Deb. '48...	107—109*d*	...	...
274,000	"	Feb. 20	5	5	Newport (Mon.) 5 p.c. max.	102—104*a*	+1	...
204,940	"	Mar. 20	7½	7½	North Middlesex 6 p.c. Con.	137—143	...	...
396,160	"	Feb. 6	5	5	Northampton 5 p.c. max. ...	103—108	...	...
300,000	"	Apl. 24	9	7	Oriental, Ltd.	114—119	...	...
316,617	"	June 26	8	8	Plym'th & Stonehouse 5 p.c.	158—163	...	158—160
504,416	"	Feb. 20	8	8	Portsm'th Con. Stk. 4 p.c. Std.	161—166	...	...
241,446	"	"	5	5	Do. 5 p.c. max. ...	104—109	...	...
114,000	"	Feb. 20	5	5	Preston 5 p.c. Pref.	103—108	...	...
686,312	"	Jan. 23	4	4	Primitiva 4 p.c. Rd. Db. 1911	80— 85	...	...
389,813	"	June 26	4	4	Do. 4 p.c. Cons. Deb.	78- 83	...	...
150,000	10	Mar. 20	6	6	San Paulo 6 p.c. Pref. ...	6⅞- 7⅛	...	...
1,736,968	Stk.	Sept. 5	6	6	Sheffield Cons.	124—128*e*	...	...
95,000	"	July 10	4	4	Do. 4 p.c. Deb.	90—94*e**	−1	...
133,201	"	Feb. 20	8½	5	Shrewsbury 5 p.c. Ord. ...	125—130	...	...
90,000	10	June 12	15	14	South African	3—5	...	...
6,709,895	Stk.	Feb. 20	5	7	South Met. Ord.	126—129	+1	126½—129
1,135,812	"	"	6	6	Do. 6 p.c. Irred. Pf.	135—140	...	137½
850,000	"	"	—	20/-*g*	Do. 4 p.c. Irred. Pf.	99—103	...	101—101½
1,895,445	"	July 10	3	3	Do. 3 p.c. Deb. ...	75—78*	−1	75½
1 000,000	"	Jan. 23	5	5	Do. 5 p.c. Red. Deb.	112—116	...	113
209,820	"	Mar. 6	8½	8½	South Shields Con.	147½—152½*d*	...	...
1,543,795	"	Feb. 20	6	6	South Suburban Ord. 5 p.c.	124—129	...	125½
300,000	"	"	5	5	Do. 5 p.c. Pref.	113—118	...	115½
868,837	"	June 26	5	5	Do. 5 p.c. Deb.	118—123	...	120—121
647,740	"	Feb. 20	5	5	Southampt'n Ord. 5 p.c. max.	107—112	...	...
121,275	"	June 26	4	4	Do. 4 p.c. Deb.	99—104	...	...
350,000	"	Mar. 6	9/-	5½	Swansea 5½ p.c. Red. Pref.	109 113	+1	110½
200,000	"	June 26	6½	6½	Do. 6½ p.c. Red. Deb.	103 108	...	...
1,076,490	"	Mar. 6	6⅔	6⅔	Tottenham and District Ord.	142—147	...	142—145
300,000	"	"	5½	5½	Do. 5½ p.c. Pref. ...	123—128	...	...
62,285	"	"	5	5	Do. 5 p.c. Pref. ...	110—115	...	...
199,005	"	June 12	4	4	Do. 4 p.c. Deb. ...	96—101	...	...
85,701	"	Apl. 3	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	80— 85	...	...
347,769	"	Mar. 6	7	7	Uxbridge, &c., 5 p.ct. ...	140- 145	...	...
88,330	"	"	5	5	Do. 5 p.c. Pref. ...	110 115	..	...
1,322,220	"	July 10	7	7	Wandsworth Consolidated	142—147*	−3	...
1,096,373	"	"	5	5	Do. 5 p.c. Pref.	110—115*	−2	...
1,317,964	"	June 26	5	5	Do. 5 p.c. Deb.	118—123	...	...
158,400	"	Mar. 6	5	6A	Winchester W. & G. 5p.c. Con.	109—114	...	...

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock. *g.*—For quarter. *h.*—Paid £3, including 10s. on account of back dividends. *Ex. div. † Paid free of income-tax. ‡ For year.

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150
ENGINEERS
Purify
66,000,000,000
cub. ft. of coal gas
per annum
with
OUR
OXIDE

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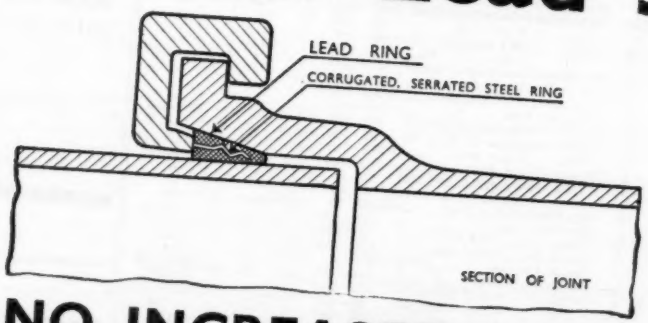
The STANTON
Mechanical Lead Joint

(Patent applied for)



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The Stanton Ironworks Company Limited, Near Nottingham

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A copy of the "G.J." Calendar and Directory is presented to Continuous Subscribers.

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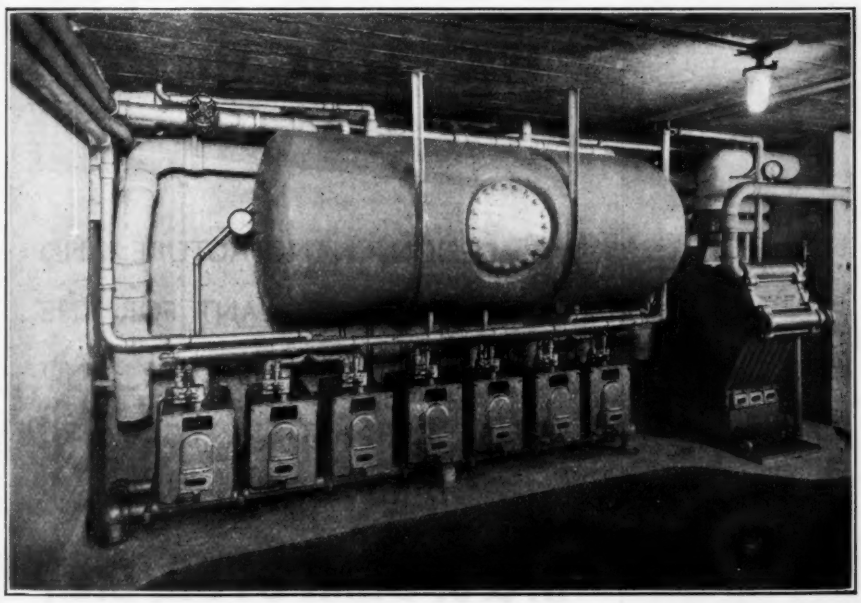

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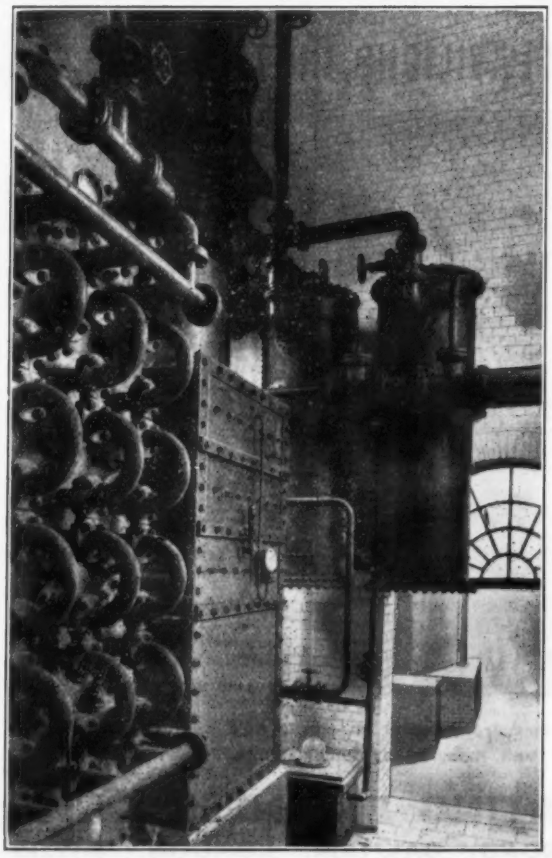

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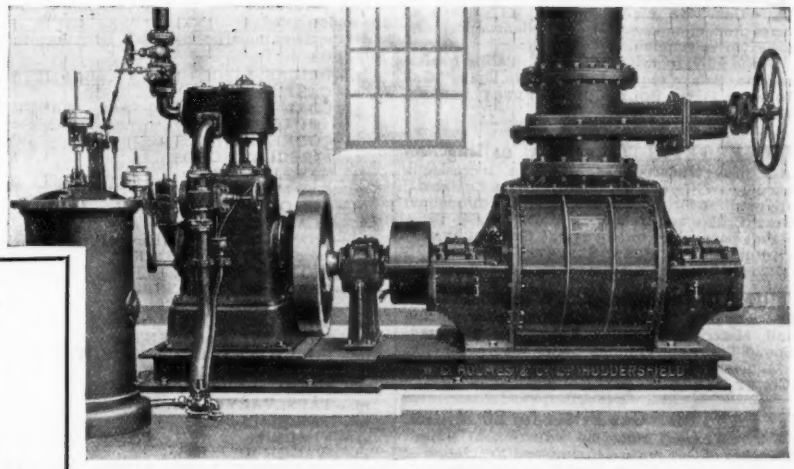

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1930

(*Extract from letter dated 4th February, 1930.*)

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1933

(*Extract from letter dated 17th February, 1933.*)

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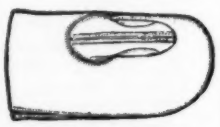
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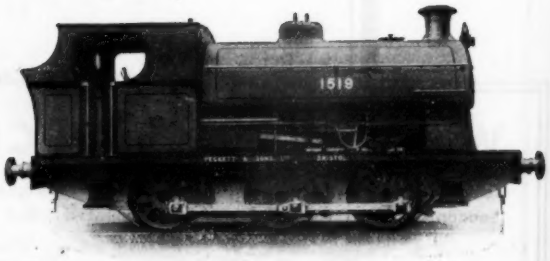

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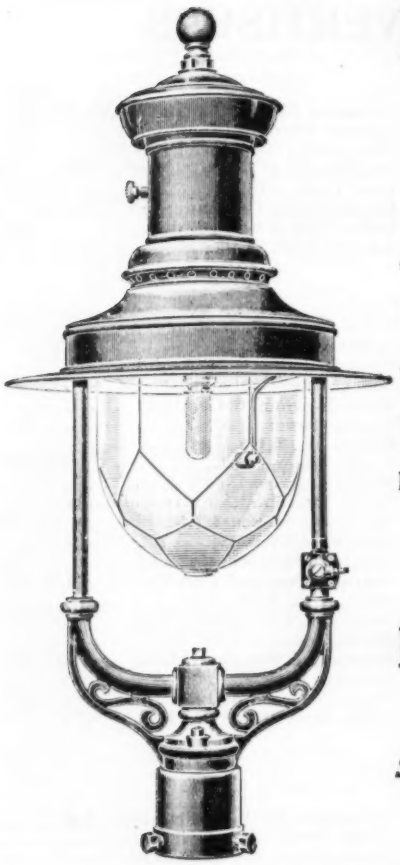

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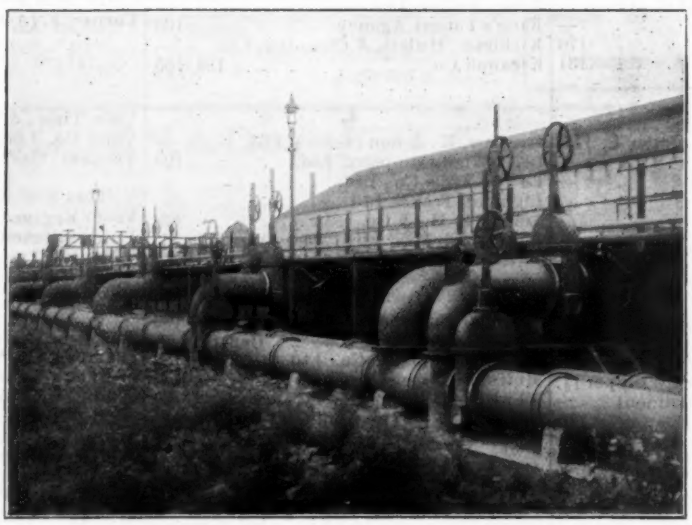

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